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CONSTRUCTION

METHODS AND EQUIPMENT

September 1952





CONTINUOUS-LINE FLUORESCENT LIGHTING—key feature of Brooklyn-Battery electrical system—gives safer, shadowless illumination. Variable light intensity and lower operating costs are other important features.



WELL-LIGHTED APPROACHES lead to tunnel. In daytime, lighting inside the entrance is brighter to provide better transition from sunlight.



CENTRALIZED CONTROL permits one man to operate the complete electrical system—lights, fans, pumps and safety equipment.

Ribbons of light mean safer, lower-cost tunnel operation

Fluorescent lighting, central control, reliable power highlight G-E system at Brooklyn-Battery Tunnel

Now handling 16,000,000 vehicles a year with safety, comfort, and operating economy, New York's Brooklyn-Battery Tunnel provides an excellent example of modern tunnel electrical systems. Designed by engineers of the Triborough Bridge and Tunnel Authority and General Electric, this electrical system was the first to feature economical, variable-intensity fluorescent lighting. Centralized control and a coordinated power distribution system also contribute to operating economy and dependability.

Tunnels are just one of the many types of heavy construction projects on which General Electric is ready to assist your engineers or consultants in electrical system planning. Contact your local G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.



RELIABLE POWER—a necessity for tunnels—is provided by **G-E** metal-clad switchgear. **G.E.** also builds fan and pump drives for tunnels.

Engineered Electrical Systems for Heavy Construction



B.F. Goodrich



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• B. G. Young & Sons of Johnson City, Tenn., do general road contracting throughout Tennessee, North Carolina and Virginia. The company's 20 trucks, 6 tractors and 11 other off-the-road units roll daily over roads covered with sharp, blasted rock and gravel.

Take the unit pictured above, for example. Its tires have continuously carried 16 tons of equipment plus a payload of 20 tons of rock and dirt on just such roads for over a year. Yet not one of these B. F. Goodrich Universal tires has ever been removed from its wheel!

No wonder Mr. B. G. Young, partner of this company, says, "The service we obtain from B. F. Goodrich tires with the nylon shock shield is far and beyond anything we have experienced before."

Universal tires give such superior

service even under the toughest operating conditions because the tread is made of specially-compounded, cutresistant rubber. The tread wedges give positive 2-way traction. And Universal tires—like all tires of 8 or more plies in the complete B. F. Goodrich line—are built with the nylon shock shield, exclusive BFG development.

Layers of strong nylon cords, coated with rubber, lie between the tread and cord body. Under impact these cords stretch together to protect the tire body from shock. This shock shield increases tire mileage, boosts bruise resistance, means more tires can be recapped and reduces the danger of tread separation.

This is why Mr. Young adds: "We get more hours of service from BFG tires than from any other make we have ever used."—why his company uses

B. F. Goodrich tires exclusively on its off-the-road equipment.

There's a B. F. Goodrich tire to meet your off-the-road requirements. Most of these off-the-road tires are also available in all-nylon construction. See your BFG dealer—he's listed under Tires in the Yellow Pages of your telephone book—or write: The B. F. Goodrich Company, Akron, Obio.





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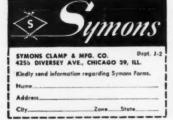


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NSTRUCTI(METHODS AND EQUIPMENT

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SEPTEMBER 1952

Established 1919

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Earthmoving-Art and Science

Oliver Brings Out Big Tractor

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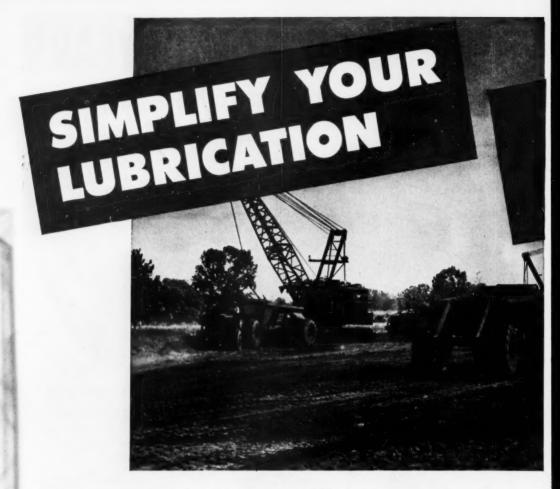


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GOODFYEAR

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Contractors in all parts of the country are saving time and money with the Texaco Simplified Lubrication Plan. They've reduced the dozens of competitive lubricants they formerly used to *only six* Texaco Lubricants – the few they need for all their major lubrication jobs. This not only saves time and work but – more important – it prevents confusion and costly lubrication errors.

6 Products Used in Texaco Simplified Lubrication Plan

1. Engine Lubrication: Use Texaco Ursa Oil X** for both heavy duty gasoline and Diesel engines. It's deter-

gent and dispersive — cleans as it lubricates. Tops for protection against wear and rust. Reduces both maintenance costs and fuel consumption.

- 2. Chassis Lubrication: Use Texaco Marfak. It gives longer lasting protection against dirt, rust and wear because it won't jar out, won't squeeze out. More than 400 million pounds of Texaco Marfak bave been sold!
- 3. Wheel Bearing Lubrication: Use Texaco Marfak Heavy Duty. It seals out dirt and moisture, seals itself in assuring longer bearing life, safer braking. No seasonal change required.

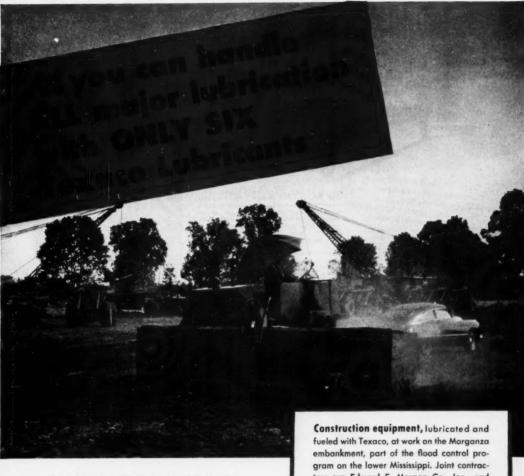
TUNE IN:

the TEXACO STAR THEATER starring MILTON BERLE.

See newspaper for time and station.



TEXACO



4. Crowler Lubrication: Use *Texaco Track Roll Lubricant* for longer lasting protection against dirt, water and wear for lower maintenance costs.

5. Air Compressor Lubrication: Use the Texaco air compressor oil exactly suited to your particular operating conditions. Clean, efficient operation assured.

6. Rock Drill Lubrication: Use Texaco Rock Drill Lubricant EP. Its "extreme pressure" and rust-inhibiting properties assure longer drill life.

Let a Texaco Lubrication Engineer give you full details of the Texaco Simplified Lubrication Plan - its advan-

Construction equipment, lubricated and fueled with Texaco, at work on the Morganza embankment, part of the flood control program on the lower Mississippi. Joint contractors are Edward E. Morgan Co., Inc., and Jones & Gillis, Inc. Dirt-moving operations, started in June, 1949, call for placing 3,985,000 cubic yards of semicompacted embankment. Equipment includes 4 draglines, 9 tractors and 53 trucks — all of which are lubricated with Texaco exclusively.

tages and economies for you. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT





Twin Disc Three-Stage Hy draulic Torque Converters helped George M. Brewster and Son, Inc., Bogota, N. J., contractors, keep the bell from ringing on this New Jersey Turnpike job near Seaucus, N. J. Installed on rugged Model KX-25T Buffalo-Springfield rollers-3-axle tandem type with a working weight from 14 to 20 tons—the Twin Disc Converters eliminate ridge-producing shifting -provide a smooth, even power flow which prevents roller slippage and sudden starts and stops. Buffalo-Springfield chose Twin

Disc Three-Stage Converters because of their extreme compactness -a vital factor where space is at a premium-and Twin Disc's smooth, stepless torque multiplication, up to six times torque input. No Bong-No Bump! This "wrinkle steuth' rings the ball when the pavement is too bumpy. It doesn't ring so often since torque-con-verter-equipped rollers are making smoother roll-ing—smoother roads—and smoother brows among contractors, public officials, vahicle owners—and

with manufacturing know-how and an unmatched service system, Twin Disc has become the largest manufacturer of industrial friction and fluid drives. Engineering, and parts and replacement service are quickly available from 8 Factory Branches, 60 Parts Stations and 67 Hydraulic Drive Dealers.





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* JOB TALK *

About Methods



Concrete Roughing Machine

Carlin Construction Co. built a heavy-duty machine to roughen the surface of a concrete sub-floor before putting down the finish floor of terrazzo on a state hospital job at Middletown, N. Y.

The shop-built rig consists of three Thor jackhammers mounted side by side on a frame which is welded to a two-wheel hand truck. Air is supplied by a 315-ft LeRoi compressor. The business end of the machine covers a width of 30 in. It is light enough to be operated by one man and covers large areas in much less time and is less tiring to the operator than handheld machines.

Cut and Quick Cover

Part of the \$7-million, 10-mi conduit being built by the Los Angeles Department of Water and Power to bring Colorado River water to city reservoirs runs along Colorado Boulevard, a major suburban thoroughfare. The department wanted to disrupt traffic on the 8-lane street as little as pos-

At least two lanes in each direction are kept open at all times. The large conduit is laid down the center island where it is wide enough

(Continued on page 12)

17'S THE ROCK UPS

Any shovel can dig dirt! But, put it in rock! Get up on a Northwest if you know "operation". Get the feel of the controls. Feel that crowd take a-hold. The dipper goes right on through as the hoist takes it up - no "re-starts" are required here. It's a full load in one cut. Remember the Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste - force that puts greater effectiveness at the dipper lip for handling tougher digging and producing more output.

To Northwest digging power add the "Feather-Touch" Clutch Control which brings ease of operation without the complications of pumps, piping and compressors; the Cushion Clutch that eliminates shock overloads before the damage is done; Uniform Pressure Swing Clutches that cut spotting time by eliminating the jerks and grabs in swinging; Northwest simplicity of design that makes upkeep easy and reduces "down time"; and all the other Northwest advantages that make Northwest a real Rock Shovel. You can plan to have a Northwest. Now is the time to find out about Northwest design and operation. Why not talk it over with a Northwest man?

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Precision-Engineered Berger "N" Line

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For laying out and measuring horizontal and vertical angles, leveling, measuring differences in elevation, setting building lines, plumbing walls and columns. 12" erecting-internal focusing, hard bronze telescope: rack and pinion adjustment; 22 power coated optics; steel spindle. Verniers read to 5 min. Dust protected leveling clamp and tangent screws.

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The "N" line* incorporates many of the features for which Berger transits, levels, theodolites and alidades are famous-have been since 1871-uses the same materials. We've merely simplified the design to build this moderate-priced line!

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Larry O'Neill, Supt. c/o Poirier & McLant Corp.

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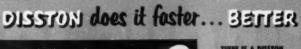
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No matter which Disston Chain Saw you choose, you're sure of getting a first quality professional tool . . one that has saved time and labor for utilities, shipyards, railroads, constructors and industrial plants the country over.

The Disston DA-211 is powered by a reliable air-cooled 2 cylinder, 2 cycle Mercury Gasoline Engine. The Mercury develops 9 hp at 5500 rpm, gives the Disston an extremely favorable powerweight ratio. Automatic clutch. Self-rewinding starter. Automatic chain lubrication. Full-swivel transmission. The narrow-profile guide rails (from 2' to 7')

reduce binding; the fast-cutting chains slice through 18" oak in less than 16 seconds. The DA-211 and its lightweight counterpart, the smaller DO-101, make perfect working partners. The DO-101 is ideal for one-man operation, and can be converted quickly into a lightweight two-man unit with rail lengths up to 40".

You will find a complete line of Disston power saws at dealers the country over. Any of these men will be glad to demonstrate how a Disston does it faster... better. For the name of the one nearest you, write HENRY DISSTON & SONS, INC., 21 Tacony, Philadelphia 35, Pa.

Sand for your free copy of the new feet-packed and platery-packed bushles.

JOB TALK . . . Continued from p. 8

but at some points it narrows down to a curbing strip.

To have the street torn up for the shortest time possible, pipe-layers follow one block behind the trenching machine. The Austin 500 trencher dumps excavated earth directly into a squad of seven trucks which haul the dirt back to fill in over the newly laid pipe. Resurfacing crews follow directly behind to lay down a temporary black top.

The concrete water conduit measures 68 in. ID and is being put into a trench 12 ft deep and 8½ ft wide. Capacity of the trencher is 3¾ yd/min.



Concrete-Sprinkler Truck

Bates & Rogers Construction Co. ran into an aggravating dust condition recently on the B&O Railroad tunnel near Clarksburg, W. Va. (CM&E Sept. 1951, p. 60). The constant movement of trucks and equipment over the supply road and floor of the tunnel created so much dust that it became a hazard to vision and health.

Dust-laying was accomplished neatly—by utilizing equipment in regular use. Bates & Rogers uses four 4C Maxon Dumpcretes to haul concrete from the job's batch plant into the tunnel. One of the trucks was fitted at the rear with a spray bar for water. An opening was cut into the bottom of its Dumpcrete body and a connecting pipe installed between this outlet and the spray bar.

Now the body is filled with water and the road and tunnel floor sprinkled as often as needed. The rest of the time the truck joins the three others in hauling ready-mix concrete.

The contractor added a special sub-frame on each of these trucks so that the Dumpcretes on this job

(Continued on page 14)

Eucs Deliver More Payloads at Less Cost

UCLIDS have what it takes to deliver more loads per hour at the lowest cost per ton or yard moved ...large capacity, plenty of power and speed, and long service life on the toughest jobs.

"Eucs" are unmatched for job availability—they've established records for high production on a wide range of construction, open pit mining, quarry operations and industrial jobs. This dependable performance is backed by Euclid distributors and factory branches with facilities to provide genuine parts and prompt service to owners everywhere.

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Bottom-Dump Euclids - 13 to 25 cu. yds.... 190 to

300 h.p....top speeds loaded to 34.4 m.p.h.

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Jaeger's 15% to 25% more air means more work for wages paid



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THE JAEGER MACHINE COMPANY

800 Dublin Ave., Columbus 16, Ohio

PUMPS . MIXERS . HOIST TOWERS . TRUCK MIXERS . PAVING MACHINES

JOB TALK . . . Continued from p. 12

have a discharge height of better than 7½ ft. The added height (about 14 in.) makes it possible to discharge concrete directly into the 36-in. wall forms on both sides of the 3,236-ft, 28-ft-high doubletrack tunnel.



Quick Disposal for Debris

Waste developed during the remodeling of the Multnomah Hotel in Portland, Ore., was removed quickly and efficiently by a combination of conveyor, Scoopmobile and dump truck.

The debris was accumulated in the basement. Then an elevating conveyor was employed to lift the scrap out of the cellar and into the scoop of a waiting Scoopmobile at the curb. This machine, in turn, lifted the refuse into a waiting truck which carried it to the dump. That's how Goldie Gentle, Portland concrete contractor, handled a disposal problem in busy downtown streets.

Long Push Saves Digging

A bit of construction ingenuity recently eliminated a lot of backbreaking excavation. Maintenance men for the Hawaiian Commercial & Sugar Co. in Hawaii installed an 18-in. pipe through the 60-ft wall of a reservoir without digging a tunnel or excavating a ditch. Major equipment employed was a 30-ton hydraulic ram and a water compressor.

First, a platform was built for the hydraulic ram. Then the ram began to push the 18-in. pipe through the earthen reservoir wall—at the rate of about 5 ft per day. At intervals water under high

(Continued on page 22)



MOVING THE EARTH... to build air power

Eight hundred thousand cubic yards of earth had to be moved before a new 9,500-foot runway could go in at Montana's Great Falls Air Force Base. And it had to be moved in a hurry.

Three big new "Cat" DW21 Tractors with No. 21 Scrapers helped speed the job. Push-loaded by "Caterpillar" Diesel D8 Tractors, these husky work horses loaded 15 to 20 cubic yards each in as little as 40 seconds, with haul cycle times of only 4 minutes for a 1,000-foot haul, 15 minutes for 5,000 feet. And Nilson-Smith Construction Co. kept them highballing like that for 20 hours a day.

That sort of service is routine for these high-speed "Cat" DW21s. The powerful Diesel engine delivers 225 HP at the flywheel and moves the giant 2-wheel tractor at 20 m.p.h. Crown shaved, "Hi-Electro" hardened final drive gears . . . strong, welded steel transmission . . . big 22-inch-diameter air-activated brakes that can be independently operated for walking out of soft spots . . . these are a few of the DW21 Tractor features. The No. 21 Scraper handles 20 yards heaped, 15 yards struck. It's self-loading, or it

works smoothly with push-loading tractors, dragline, shovel or clamshell and it empties even the stickiest materials in a hurry. Its big, low-pressure tires keep the load on top of soft fills, maintain low rolling resistance, give longer tire life.

There's more to the DW21 story. Your nearby "Caterpillar" Dealer can give you the details. See him . . . today!

CATERPILLAR TRACTOR CO., PEORIA, ILL.

CATERPILLAR

DIESEL ENGINES
TRACTORS . MOTOR GRADERS
EARTHMOVING EQUIPMENT

NOW...

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COUNTS MORE

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PEED is a traditional characteristic of Bucyrus-Erie excavators ... and speed in the individual dig, swing and dump operations only tells part of the story.

In Bucyrus-Erie machines, working speed starts on the drawing board, where cycle functions are balanced with one another (as well as being designed fast in themselves) . . . and co-ordinated with proper weight distribution. Adding smooth, steady power . . . liberally used anti-friction bearings . . . easy-filling dippers ... and direct-action mechanical control gives them the overall production speed that has made them the standard of the industry.

Eliminating lost time and waste motion is one big way to boost output wherever excavators are used. Now . . . when that counts more than ever, you can count on Bucyrus-Erie excavators to "deliver the goods." 60E52C

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin



Preventive Malnienance is just one of many important topics covered in a new 32-page booklet -- "How to Make Your Excavator Work Harder - Last Longer." It's also loaded with valuable hints on lubrication, adjustments, engine care, safety and many other phases of excavator care. Write for your copy now!

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Mobildrill — A light-weight to Rei-CLEVELAND wagen drill unit mounted on Tractair. Cests about half of whet yaw would pay for separatic compressors and rock drills to do same work. Its all-around usefulness makes drilling feater, easier. Quickly pays for itself out of savings.



Tamping — Tractair with Le Roi-CLEVE-LAND Multiple Tamper and work-saving air feed keeps up with three men shoveling or a backfilling tractor. You not only get feeter, easier tamping, but also better compection and lower costs,



Leading — Front-and loader can be attached to Tractair in only a few minutes. Beam combines bucket and crane. Crane folds back out of way, when not in use. Bucket holds 10 ½ cu. ft. — lifting capacity is 1000 lbs. Lifting capacity is 1000 lbs.

with Backhoe

cuts trenching costs for Illinois man... combines air power, digging power, and mobility, to do former two-day job in only half a day!

Your digging job too small for a power shovel? Too big to do by hand economically? Then, mister, you're money ahead with a Le Roi Tractair-Backhoe! It's a hydraulic backhoe attachment mounted on a Tractair, Le Roi's combination 35-hp tractor and 105-cfm compressor — you get both air power and digging power in a single piece of equipment.

Tractair-Backhoe units are saving money for contractors every day. Take John Proszek, plumbing contractor of Chicago, Illinois: He uses a Tractair-Backhoe to dig two ditches 60' long x 6½' deep for new home-service connections — and does in half a day what it took two days to de before!

to do before!

The versatility of Tractair helps you do many jobs with greater speed and economy. Its air power lets you break

through pavement or frost — run air tools. Its digging power lets you dig as deep as 7' — cut through hard ground that a pick and shovel can't penetrate — keep the bottom of a ditch perfectly level — dig straight-end walls and square corners.

But that's only part of the Tractair story. There are other attachments you can use to multiply Tractair's usefulness and hold down your investment in special equipment. With Le Roi-CLEVELAND air tools, you can break pavement, drill rock, dig clay, tamp fill, etc. With a frontend loader (it has 8 accessories you can interchange quickly), you can load, lift, backfill, plow snow, etc.

Ask your nearby Le Roi distributor to demonstrate a Tractair. Write today for job-data sheets and bulletins

on Tractair.

Compressors Tractair Rock Drills Engines . . .



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Backfilling — A backfill blade adapts the versatile Tractair for such jobe as filling trackes, light grading, and other light dazing work — anywhere along the job site. Backfill blade is 6' wide, moldboard is 2'8' high. Maximum lift above ground is 1'a".



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• This HAZARD brand on wire rope got started in 1846. It's a top brand today not because it goes back 106 years but because Hazard wire rope has kept on improving.

Hazard research and engineering has built more hours of useful work into ropes that carry this brand name. It has experimented with metals and alloys and every known lay. It is working harder than ever today improving the ropes that bear its name.

Hazard's especially proud of its LAY-SET Preformed WIRE ROPE. You can tell it by the green strand. It lasts longer and costs less to use.

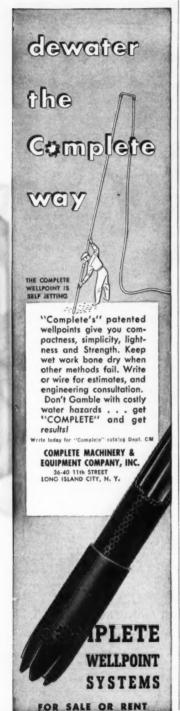


HAZARD WIRE ROPE DIVISION AMERICAN CHAIN & CABLE makers of inequistered wire rope slings

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.







JOB TALK . . . Continued from p. 14

pressure was forced into the pipe to clean out the dirt core. After about three weeks, the pipe "holed through" inside the reservoir.



Lift Truck Pile Driver

Haymond Concrete File Co. uses as standard arrangement a piledriver hammer mounted on a lift truck to drive piles indoors where headroom is limited.

Pictured here is a 9-B-2 Mc-Kiernan-Terry hammer mounted on a Towmotor truck. The job was driving 10¾-in. pipe piles inside the plant of the Toledo (Ohio) Blade for foundations for an additional pressline. Sixteen pipe piles were driven in sections to an average depth of 37 ft. Smaller diameter pipe piles in short sections often are driven with this type driver to suitable bearing for the 1 nderpinning of existing structures.

Looking on in the photograph are: Raymond Supt. John Nichols, Toledo Blade Supt. Wiley and pile-driver foreman Pete Kelly. Lorel Bolander is operating the rig.

Trucks Trip Signal

According to a recent issue of the "LeTourneau Co-operator", trucks hauling cement to Hungry Horse Dam in Montana had to enter the only road to the dam by a left turn across a busy highway at the foot of a steep grade.

A steady flow of material without fear of accidents was assured by equipping the trucks with radio signaling sets which enabled drivers to turn the traffic light at the intersection in their favor when approaching it. The cement trucks made the turn safely without delays, a timing device turning the traffic signal green for highway traffic after a cement truck had passed.

WINNER

in the

A. O. SMITH

"CASH FOR NAME" CONTEST

is

PRESTON MURRAY WELLSVILLE, UTAH

who submitted

FIELD KING

and was awarded

FIRST PRIZE OF \$300

by the judges

SECOND PRIZE OF \$200.00
WAS WON BY
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THIRD PRIZE OF \$100.00
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SEATTLE, WASH.

All of the many contestants who submitted names for the new A. O. Smith engine-driven welder have been sent gifts in appreciation of their interest and participation in this event. Only three of them could win prizes. We appreciate very much the gratifying response on your part to our invitation to complete in naming our welder.

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WELDING PRODUCTS DIVISION MILWAUKEE 1, WISCONSIN

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GAS ENGINE-DRIVEN DC FIELD WELDER

Here it is! The most advanced of all engine-driven welding machines now available!

h's the A. O. Smith "Field King," built to thrive on rugged jobs in the field...to endure the rough handling of transport... to withstand any weather... and to turn out better welds, faster and smoother!

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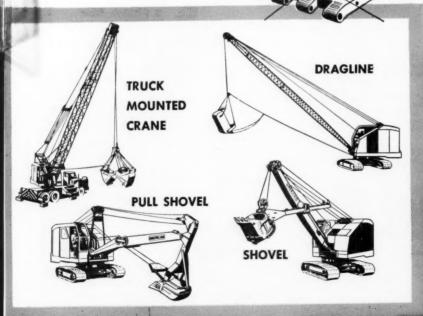
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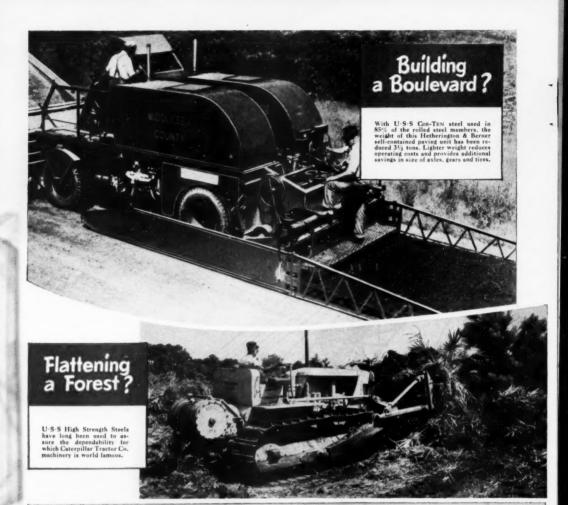
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U·S·S COR-TEN STEEL

U-S-S Con-Tan is a duetile, low-carbon chromium nickel silicon copper phospherus steel having a minimum yield point, in thicknesses of ½" and under, of 50,000 pei-at least one and one-half times that of structural carbon steel.

It has a minimum tensile strength of 70,000 pai in these same thicknesses. In resistance to shression and shock it is superior chat is, its ability to withstand vibration stresses—is 60% greater.

What particularly distinguishes U-S-S Con-Tan steel is sits unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper ateal. It is this property that assures the safety, long life and low maintenance cost of any equipment in which Con-Tax steel is used.

U-S-S Con-Tax steel is produced in all standard products—plates, shapes, have, shear, shear, shapes, have, shear, shear,

U·S·S MAN-TEN STEEL

U-5-S Man-Ten is a grade of manganese-copper steel possessing formability, toughness and weldability in a higher degree than obtainable in exponence of the same strength level.

U-5-S Man-Ten steel has the yield point and high tensile strength of \$9,000 pp is and 75,000 p4, respectively, in thicknesses up to ½" inclusive. Its abrasion resistance is greater than that of structural carbon steel (ASTM A7); its fatigue atrength is approximately 40% higher, insuring greater resistance to the vibration and reversal of streams to which many types of equipment are subjected.

U-5-S Man-Ten steel is well suited for applications requiring high strength, toughness, workability and weldability together with atmospheria corrosion resistance equal to or slightly better than that of copper steel. More than 15 years of attifactory service under the must severe conditions have entablished decontruction.

U-S-S Man-Ten steel is produced in plates, shapes, bare, heets, strip, special cold-formed sections and other products. It is particularly recommended for light and intermediate thicknesses.

U-S-S TRI-TEN STEEL

This manganese-nickel-copper steel has a yield point of 50,000 poi min. and a tensile strength of 70,000 poi min. in thicknesses of \$7, and of 70,000 poi min. in thicknesses of \$7, and the steel of 50,000 point min. In thicknesses of \$7, and the steel of 50,000 point min. In thicknesses of \$7, and the steel of 50,000 point min. In this firster resistance to abration than structural carbon steel (ASTM A7) and its fatigue resistance is 50% higher. It also has superior toughness and shility to withstand shock at sub-zero temperatures. U.S.S TRI-TEN steel's resistance to atmospheric corrosion is superior to that of copper steel.

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prime requisites.

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* Buring the present critical shortage of nicket, we energency manganese-copper-vanadism grade, identified as U.S.S TRL-TEN "E" steel is being produced in place of U.S.S TRL-TEN steel. Thus equivalent engineering retines and its use is recommended in place of U.S.S TRL-TEN steel.



U·S·S High Strength Steels your equipment can take it!

No matter what the job, these famous "steels that do more" give your equipment the ruggedness, the durability to keep going day after day, month after month.

With equipment built of U.S.S Cor-Ten, U.S.S Man-Ten, and U.S.S Tri-Ten steels instead of carbon steel you have fewer time-wasting breakdowns. Maintenance costs drop and bills for replacements are far lower. You save money and you do the job better and quicker.

That, in a nutshell, is the story of U.S.S HIGH STRENGTH STEELS as they are used in construction and earth-moving equipment.

These high strength steels have a yield point 50% higher than ordinary structural steel and afford high resistance to fatigue, abrasion and impact. For equipment which must operate in

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You can use Cor-Ten, Man-Ten and Tri-Ten steels to build maximum strength and toughness in vital parts ordinarily prone to fail. With them you can materially increase the strength of parts without increasing their weight. Or you can use these steels in lighter sections and reduce weight without reducing strength or stamina. In the latter case a substantial saving in steel will result.

Contact our nearest office and let us show you exactly how you can apply U·S·S HIGH STRENGTH STEELS to make your equipment last longer. For 18 years our engineers have cooperated with manufacturers of the best construction equipment in applying these steels.

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2.140

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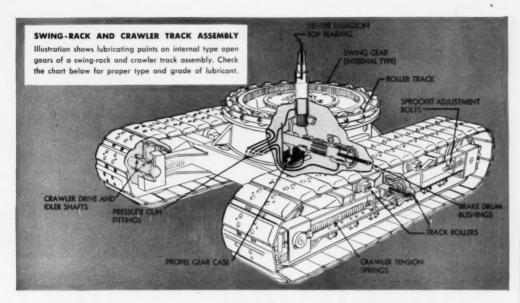
Compare value before you buy-

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PRODUCTION FIGURES

show why Northwest Constr. Co. owns 9 electric Tournapulls



To speed this 250,000-yd. channel change and highway job near Buckley, Washington, Northwest Construction Co. drove in 4 of their 9 C Tournapulls . . . averaged 130 pay yards of wet blue clay hourly over 3-mile cycles. Step-by-step story at right shows how one of these rigs performed on a typical round trip. As you follow the "C" around its course, you'll find at least 10 reasons why you — like this Seattle contractor — will haul more yards per hour with Tournapulls. For further information, get in touch with your LeTourneau Distributor. He'll be glad to help you make your own estimate of "C" production . . . costs . . . and profits.

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GETTING INTO LOAD POSITION, "C" uses short 15' turn radius to good advantage...reverses direction in narrow channel without stopping or backing up. Maximum turn angle is 90°.



RIG HEAPS IN more than 10 pay yards of heavy, sticky blue clay. Load time, in this tough material, with 175 h.p. tractor-pusher, averages just under 1 minute . . . load distance, about 150 feet.



CLIMBING GRADE out of channel cut with full load is easy for Tournapull. The 186 horsepower rig accelerates rapidly as it leaves the pusher . . . saves important seconds on every cycle.



HIGHBALLING TO FILL, Tournapull averages 12½ m.p.h. for the 1½-mile trip...completes oneway haul in 7 minutes. Rig averaged 20 m.p.h. through heavy traffic on 25-mile trip to job.



UP GOES APRON...load is pushed out "on the run" in 20 seconds. With electric scraper controls, operator spreads clay in smooth layers. Big 21.00 x 25 low-pressure tires help compact fill during normal travel to and from cut.



RIG HEADS BACK for another load. The 4 "C's" on this job moved more than 13 loads hourly. Says Supt. John Vineyard, "What I like about this C Roadster is its speed and ease of turning, plus its weight balance. That's what counts!"





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Now, the new Barber-Greene Mixall gives you the opportunity to offer high quality bituminous paving for driveways, sidewalks, service stations, industrial plants, parking lots . . . and other "black top" jobs at new low costs.

The Mixall, a completely new, compact and portable small-job maintenance and paving mixer, will produce up to 5 t.p.h. of any type hot mix... up to 10 t.p.h. of cold mix... will produce low slump Portland cement mixes. Built to be towed behind the aggregate truck for on-the-spot mixing, the Mixall is just as well suited for central plant or stock pile operation. The Mixall can work in any weather... even drying frozen aggregates.

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 TWIN SHAFT HEATED PUGMILL:
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1200 c.f.m.

Here's an efficient, dependable set-up for a job requiring 1200 cubic feet of air a minute — two CP Model 600 Diesel-driven PORTABLE AIR COMPRESSORS.

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ANCHOR SLOTS

Pat Pending



METAL BRICK ANCHOR



DOVETAIL STONE ANCHOR



WIRE BRICK ANCHOR



FILLED ANCHOR SLOT showing filler partly removed.

EXCLUSIVE DESIGN

These cross and longitudinal ribs provide extra rigidity and strength.

Anchoring brick or stone to concrete with Superior dovetail Anchor Slots is easy and dependable at all times because of its exclusive design.

Ordinary dovetail slot often narrows at the throat when concrete is poured, making it difficult or impossible to insert the dovetail anchor. This narrowing is caused by the arching of the back of the slot, due to the concrete pressure on the sides. With Superior improved dovetail Anchor Slots, the cross ribs prevent the arching action, while the longitudinal ribs keep the slot straight and rigid. A comparison of dovetail Anchor Slots with and without ribs shows an astonishing difference in rigidity and strength.

Filled Anchor Slot is available where seepage into the slot is a problem. Rope-like filler is easily pulled out leaving clean slot for installation of anchors. Eliminates tedious and expensive job of removing hardened grout.

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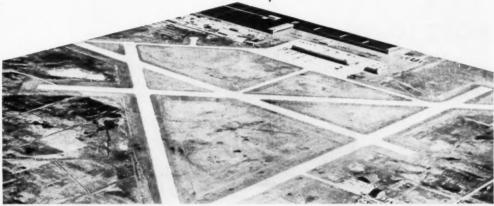


Photo by Elmer Weaver for International Harvester Co.

Aerial Tramway Gives Tractor Big Lift

CRADLED IN THE SKIP of the largest aerial tramway ever built for a construction job on this continent, an International TD-24 tractor approaches the west portal of the I0-mi main power tunnel 2,600 ft, above British Columbia's Kemano River valley on the Aluminum Company of Canada's Kitimat development. The tractor will be used by Morrison-Knudsen Co., Inc., contractor for the power project, to buildase muck away from the tunnel portal. The tracmay, 5,500 ft long, rises on a 30-deg slope from sea level to El. 2,600. Its skip rides two 2½-in. cables, and is hauled by 11,800 ft of 1½-in. wire rope handled by a double-drum Ottumwa hoist. M-K built the cerial line instead of a road to serve the tunnel and also a penstock adit at the 1,600-ft. level.

8 winters . . . impact of countless high-speed landings prove DURAPLASTIC'S durability



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Only a Black Top Paver with a screed with a straight lift can do this. Adnuns do things other Black Top spreaders won't do. They make new roads out of old. Ask for the Booklet "Why." It brings you some new thoughts on Black Top Pavers.

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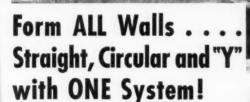
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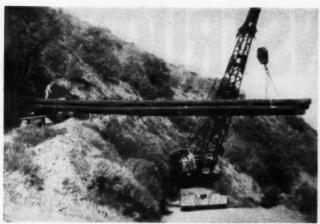
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Service Wherever You Build . . . Coast-to-Coast

Construction News in Pictures...



POLES GO AROUND HAIRPIN TURN — The Los Angeles Department of Water and Power took 75- and 85-ft poles along narrow mountain roads with sharp curves by using two vehicles, a truck-tractor with special swiveling bolster and a 20-ton Bay City truck crane with a 35-ft boom. The truck took the lead with its end of a bundle of poles and the crane trailed, lifting the hind end of the bundle and maneuvering the long load around sharp bends. Transit speed averaged about ½ mph.



MAMMOTH — Giant tire, 10 ft high, and 4 ft wide, gets test run on a 35-ton Tournapull before installation on a special machine designed by R. G. LeTourneau. Firestone built, it is for experimental use with a "swamp buggy" under development.



PROFITABLE INGENUITY — Job-built boom and bailing bucket, mounted on a Bucyrus-Erie dozer-shovel on an International TD-6 crawler tractor, drein a small cofferdam for contractors Wieske & Smith, curb and gutter construction specialists of Marshal, Minn. This successful rig is hooked up quickly and is handy in the building of sewers, drainage holes and cuts.

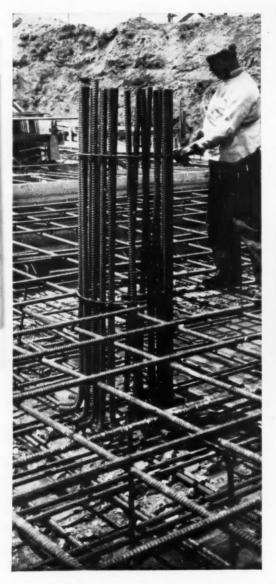


GRADER BECOMES DITCHER —Caterpillar No. 12 motor grader with DoMor elevating loader excavates a lateral canal on irrigation project near Poplar, Calif. Another grader follows on bank to level windrow. Confractor is Madonna Construction Co., San Luis Obispo.



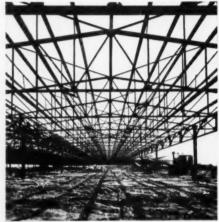
JACKING THE CULVERT — Armoo Drainage & Metal Products here uses a Joyce-Cridland 50-ton air jack and lengths of steel H-beam to push one of twin 66-in. Armoo corrugated drainage pipes, 88 ft long, through the fill under the Pennsylvania R.R. near Larabee, Pa. Hand tools were used for excavating ahead of the pipes and dirt was removed with wheelbarrows.

CONSTRUCTIVE



INLAND HI-BOND

The deep, reversed, double-helical ribs of Hi-Bond reinforcing bars provide a mechanical grip which gives maximum bond in concrete, thus permitting greater use of steel's potential strength in concrete construction. It also improves transfer of stresses, crack control and resistance to slip . . . advantages that will make possible higher design stresses and thereby lower construction costs. Hi-Bond meets standards set up by ASTM A 305.



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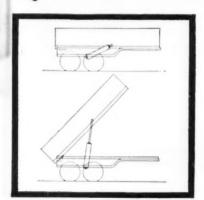
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Like all Talbert Trailers, this lightweight dump semi-trailer has many superior features producing another outstanding Talbert product.

- Approximately 9,800-lbs. empty weight
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Outstanding features make an outstanding trailer!

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

Harold W. Richardson, Editor

100 Years in Retrospect...Now What?

WHAT AN INSPIRATION! Some 30,000 members of 55 technical organizations gathered in Chicago for the Centennial of Engineering, reviewed the scientific events of the past century, took stock of the present, and lifted the veil of the future. Delegates from all over the world joined with the American Society of Civil Engineers in celebrating its 100th Anniversary.

This was far more than a meeting of technicians talking to each other-it was a pronouncement to the world as to how modern engineering paces civilization and affects the economy of all peoples.

Rightly, construction took an important part in the convocation, for construction is fundamental to all engineering, to the advancement of all civilizations, to the welfare of mankind. The construction industry reviewed its progress over the past years, analyzed the development of the astounding mechanized procedures of the present, and took a look ahead.

From the dawn of history to the turn of the present century little progress was made in the methods of construction-for building all through the ages was a hand operation, aided only in part by animal power. Yet constructors at Chicago paid tribute to those stalwart builders of old, marvelling how they built so boldly and so well with what they had.

The might of modern construction lies in its almost complete mechanization, in the skill of its equipment operators and tradesmen, and in the ingenuity, knowhow and experience of its management. Mere machines do not alone make for efficiency and success. They must have competent operators, and they must be intelligently applied, used and maintained for fast, economical operation.

The March of Mechanization

Mechanization of construction started late last century with adoption of steam power for shovels, wheel tractors and hoists. It gained momentum during the first two decades of the present century with gas engines and compressed air. It then surged ahead in the past 30 years with dieselization, pneumatic tires, crawler treads and application of mechanical power to practically every tool and device used in construction.

In reviewing the products that have boosted con-

struction ahead in great strides we can point out the power shovel, rock drill, air compressor, crawler tractor, bulldozer, paver, dump trucks, bottom-dump wagons, are welder, carrying scraper and truck cranes as most significant, followed by the host of specialty tool machines.

The Centennial of Engineering finds construction a highly organized, competent and well-equipped industry. As never before, it is able to build better, faster and more efficiently.

It can take the physical requirements of modern civilization in stride; it can meet any demands for the creation of structures any place, any time, regardless of weather, terrain, ground conditions or accessibility. The construction industry is one of the marvels of modern times.

Added Responsibility

As such, it must accept a grave responsibility for its actions, for its ever-increasing ability, and for its integrity and public trust. Comprising from 10 to 15% of the national economy, the industry is obligated to see that its part in creation of the national wealth is carried on expeditiously and honestly.

In looking ahead we are confident that construction will fulfill these obligations, just as it has done so well in the past. The equipment industry will do its part in supplying constructors with better and more useful

tools and machines.

Labor some day will concentrate more on supplying the skilled men required and less on bickering as to craft and job assignments in the increasing complexity of construction operations. Contractors and constructors will ever apply their experience, ingenuity and ability to better ways of building.

Out of it all will come an ever greater construction industry to serve well the needs of mankind in creating the physical works demanded by new civilizations.

Tich



Across the prairies and rocky hills of Wyoming . . .

II P R R Photo

Dirtmoving Highballs on the U. P. R. R.

By HAROLD W. RICHARDSON, Editor

SCALPING the treeless prairies outside of Cheyenne, Wyo., and slashing through the pine- and rock-studded hills to the west, eight dirtmoving spreads of Morrison-Knudsen, Inc., are handling more than a million cu yd per month on a 42-mi line change for the Union Pacific R. R. The spreads are made up of different equipment items, each group planned to best tackle a certain section of the line.

Project manager Bob Denham deploys his outfits according to terrain and ground conditions with all the finesse of a general fighting a major battle. As one spread may be working miles from the next one, each outfit is equipped and operated as a separate unit. They are tied to gether only by radio-equipped Jeeps.

The new line change is the biggest undertaken by the railroad since driving of the Golden Spike 82 yr ago. By looping around to the south, it bypasses Sherman Hill, highest point on the U. P., thus reducing the westbound maximum grade of 1.55% to a uniform 0.82% grade (see map). The railroad believes operating economies resulting from cutting down the present steep grade to the maximum existing elsewhere on the line warrant spending some \$16,000,000 on the job.

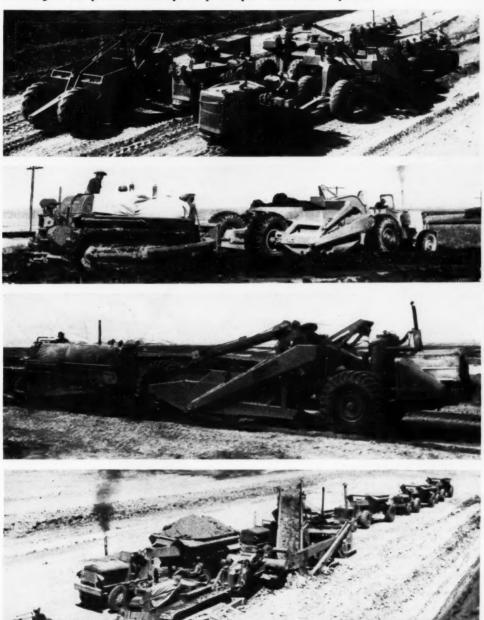
From Cheyenne the new line will be double track 6 mi south to Speer, where the Denver branch takes off. From here a single-track line extends westward to meet the present main line at Dale Creek, 36 mi away. The present main line down Sherman Hill will be used for eastbound traffic only, with one of the two tracks being assigned for use of the Granite Canyon crushing

and screening plant which produces most of the ballast required by the railroad. Though the new westbound route will be 9 mi longer than the present line, running time will be reduced as much as 15 min.

The Union Pacific negotiated a contract with Morrison-Knudsen for grading and installation of culverts, and the railroad is handling ballasting, track-laying, signalling and fencing with its own forces. The new line traverses extensive ranch lands, but the ranchers were placated by steel-post tight fencing of the right-of-way and installation of numerous culverts for stock underpasses.

These, and drainage structures, consist of Armco Multiplate corrugated culverts from 6- to 15-ft dia. There are also scores of smaller corrugated drainage culverts. Two

Grading in the prairie country is by scraper and loader spreads



FOR THE FIRST 25 mi west out of Cheyenne the new line traverses treeless prairies where clay is the predominating material. These are the outfits doing the earthmoving on that end of the line: Top—Two spreads like this, totaling 15 Cat D-8 tractors and Wooldridge scrapers, have been assigned yardage quota aggregating 1,852,880 cu yd. Combined, they turn out 600 cu yd per hr. Top center—Three Cat D-20 scraper rigs with TD-24 push tractor work

together, turning out 240 cu yd per hr. They are assigned 321,000 cu yd. Lower center—Another fast fleet is a spread of five Wooldridge Tera Cobras, moving 400 cu yd per hr for an assigned total of 998,000 cu yd. Bottom—Long cuts, totaling 737,500 cu yd. have been assigned to this Euclid loader outfit feeding 12 Euclid bottom dumps. They handle 450 cu yd per hr. Naturally, that string of empties indicates start of shift,—U.P.R.R. Photos

Through the rocky hills it's big shovels and end-dump trucks





FOR THE WESTERN 17 mi the new route elimbs through pine-studded rocky hills, where deep cuts and high fills are necessary to keep the line on uniform grade. Here shovel and truck outfits are doing the grading: Top-Biggest rigs on the job are two 5-yd Manitowoc 4500 diesel shovels like this, loading the Euclid end-dumps. Between them, the two shovels have been assigned 1,895,300 cu yd of rock and overburden, and they each turn out 300 cu yd per hr. Upper center—Two of these 21/2-yd Northwest 80-D shovels are usually found working pretty close together, loading into Euclid enddumps. Together they are assigned 751,000 cu yd at the rate of 300 cu yd per hr. A third 80-D is kept handy for odd jobs. Bottom right-Solid granite in the big cuts disintegrates into granular material like this when drilled and shot. End-dumped from Euclid trucks, it makes excellent fill. -U.P.R.R. Photo



of the 15-ft underpasses are for county roads. These, and the stock runs, will be asphalt paved over gravel base.

The first 25 mi out of Cheyenne runs through prairie land where the ground is all clay. Then the line breaks into picturesque pinecovered rocky hills and deep ravines, where the material is largely disintegrated granite over solid rock. Fills up to 170 ft high and cuts to 140 ft deep are necessary to maintain the uniform grade through the rough country. Fills are topped out 20 ft wide; cut bottoms are 50 ft wide. Rather than exactly balance cuts and fills, the railroad engineers found it more economical to borrow and waste in some places to keep the maximum haul down to 8,000 ft.

Out of 61/2 million cu yd total

excavation, some 2½ million yd are rock. The disintegrated granite, easy to dig with a shovel, overlies solid granite along the west half of the line, though big boulders and rock outcrops are prevalent.

When drilled and shot the solid granite breaks down into the same disintegrated material as the overburden. All this makes excellent fill material, standing well on 1½:1 slopes. One fill alone takes 775,000 cu yd, and 350,000 cu yd is coming out of the biggest cut.

This is a highball job, started last February and scheduled for completion for train operation in July, 1953. Grading will shut down during the worst of the coming winter months. An early and mild spring this year got the project off to a good start.

To meet this fast schedule the

contractor carefully studied the line and then set up eight different grading spreads, each with a definite yardage quota and assigned to specific locations. The exact number of equipment units working on each spread varies from time to time according to haul conditions. Because each spread is designed to meet certain ground and terrain conditions, it is often necessary to leap-frog them past each other.

Here are the grading outfits and their total yardage quotas.

FOR THE CLAY COUNTRY:

- 1. Caterpillar tractors and Wooldridge scrapers, 960,000 cu yd (300 cu yd per hr).
- 2. Caterpillar tractors and Wooldridge scrapers, 862,880 cu yd (300 cu yd per hr).
- 3. Caterpillar DW 20 (4 wheel tractors) scrapers, 321,000 cu yd (240 cu yd per hr).
- 4. Wooldridge Terracobra (2-wheel tractors) scrapers, 998,000 cu yd (400 cu yd per hr).
- 5. Euclid Loader and Euclid bottom-dump wagons, 737,500-cu yd (450 cu yd per hr).

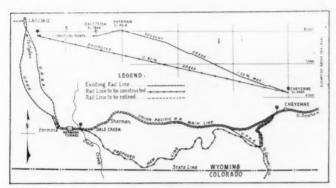
FOR ROCK COUNTRY:

- 6. Manitowoc 5-yd shovel with Euclid end-dump trucks, 975,600 cu yd (300 cu yd per hr).
- 7. Manitowoc 5-yd shovel with Euclid end-dumps, 919,700 cu yd (300 cu yd per hr).
- 8. Two Northwest 80D 2½-yd shovels with Euclid end-dumps, 751,000 cu yd (300 cu yd per hr). Sometimes a third 80D shovel works with this spread.

The accompanying pictures and captions portray the grading operations. A list of major equipment items is given in the table.

Six special tractor-mounted drill rigs, developed by the contractor, do most of the drilling for rock cuts. Long sidearms have been fastened to the bulldozer trunnions on a Cat D-8 tractor, connected across the front by a heavy pipe bar. This assembly can be lowered and raised by a front-end power control unit, and also can be stabilized by screw-jack outriggers. A Worthington wagon drill with 15-ft feed is clamped to the long crossbar. The drill can be moved to any point on the bar and can be turned to operate at any angle from horizontal to vertical.

A Worthington 365-ft compres-



NEW LINE reduces westbound 1.55% grade out to 0.82%, though it is 9 mi longer. Present eastbound track will continue in service. Ballast plant, half way up Sherman Hill on old line, will use present westbound main track for shuttling ballast cars into Cheyenne yards.



POWDER LOADING CREWS work 'round the clock. Tractor-drawn trailer-mounted generating set complete with floodlights illuminates their work at night.

Special tractor-mounted wagon drills ideal for big rock cuts



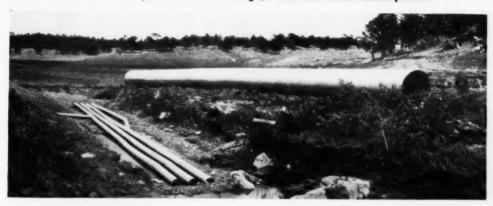




SIX OF THESE tractor-mounted drill rigs, each carrying a Worthington wagon drill with 15-ft feed and a Worthington 365-ft compressor, all on a Cat D-8 tractor, put down 30-ft holes in fast time for the deep rock cuts. Wagon drill, clamped to cross-bar on long trunnion arms, can be positioned to drill at any angle from horizontal to vertical. Long steel, tipped with Timken carbide bits, is carried in steel boot and ring at bottom and top of drill frame to save handling in changing steel.—U.P.R.R. photos, except left center



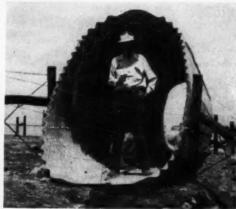
Culverts, culverts everywhere for drainage, road and stock underpasses





ARMCO MULTIPLATE culverts up to 15-ft dia take the place of bridges, highway underpasses and stock passes. Top—Smaller Armco drainage culvert, with perforated pipe subdrains for swampy condition. For corrugated pipe (not Multiplate) under high fills U.P. engineers insist on 2-ft concrete encasement, of which Armco takes a dim view, protesting that this increases rather than decreases, load on pipe. Center—Bucyrus-Érie Hydrocrane, mounted on a six-wheel truck, proves handy rig to erect heavy sections of 15-ft Multiplate drainage culvert. Sections are bolted together (U.P.R.R. photo). Bottom—For size, U.P. engineer Warren Tyler stands inside 15-ft-round Multiplate county road underpass, and 67x91-in. stock pass. Road and stock passes will be paved with asphalt over gravel fill.





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What It Takes to Move 612 Million Yd for a 42-Mi New Railroad

- 34 Caterpillar D-8 tractors
- 1 International TD-24 tractor
- 15 Wooldridge TC-170 scrapers
- 5 Wooldridge Terra Cobra TCS-142 scraper rigs
- 3 Caterpillar DW-20 scraper rigs
- 8 Caterpillar No. 12 patrol graders
- 3 Northwest 80-D 21/2-yd shovels
- 2 Manitowoc 4500, 5-yd shovels
- 15 Euclid end-dump trucks
- 12 Euclid bottom-dump wagons
- 1 Euclid 75-V loader
- 6 Special tractor-mounted wagon drills
- 2 Portadrill earth augers
- 10 Wagon drills
- 10 Portable compressors
 - Ballast

sor, driven from the rear power take-off, is mounted at back of tractor and two air receivers are strapped to the side. A side loop at the top of the drill rig, along with a steel boot at bottom, permits long steel to be stored along-side the feed run, saves a lot of trouble in changing steel. At first these rigs were drilling up to 30 ft deep, but experience soon showed that 24-ft maximum holes gave better blasting results.

Other drilling, such as busting big boulders and removing rock outcrops, is done with wagon drills and jackhammers served by portable compressors. Two truckmounted Portadrill earth augers do any necessary deep drilling

through clay.

While access to the line was possible at quite a number of points over county roads and ranch trails, these had to be improved enough to take the big lowbed trailers

hauling equipment. In addition, the contractor is building a considerable mileage of access roads.

Three repair shops have been set up out of line, and a bigger shop is located at Cheyenne. Repair trucks equipped with a crane and gas and electric welders are available for emergency repairs. Grease and fuel trucks service all equipment out on the line.

For the Union Pacific W. C. Perkins, system chief engineer at Omaha, is in general charge. Assistant chief engineer J. A. Bunjer is directing operations on the project, assisted by F. W. Tomlinson and Warren R. Tyler.

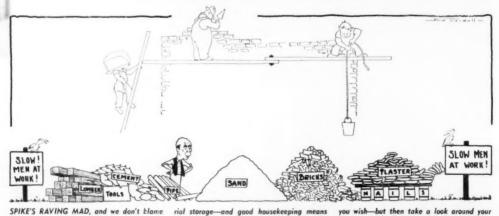
The job is being handled by Morrison-Knudsen's railroad division, which is headed by vice-president Murray E. Burns and manager J. A. Harker. R. E. (Bob) Denham is project manager in direct charge, assisted by R. J. Jones. Tom S. Newby is equipment



TRUCK-MOUNTED Portadrill earth auger drills through clay overburden, when necessary. There are two of these rigs on the job.

superintendent, and Walt Romberg is project engineer for the contractor. Culvert installation is under separate contract, with Dean Rule as superintendent.

Poor Housekeeping Can Ruin Any Job



SPIKE'S RAVING MAD, and we don't blame him. Look at the way he found materials stored on this job. An exaggerated condition? Not on your life—this could have been a photograph of many a job we have seen.

Good housekeeping starts with proper mate-

a well-planned, smooth-running and safe construction operation. Sloppy material storage is both an accident hazard and a wasteful procedure.

rocedure.

Laugh at Spike's dumb amazement here if

you wish—but then take a look around your own material piles just to make sure Spike couldn't complain if he showed up today. The sign at the right is not an artist's error. It is descriptive of every operation where handling and storing of materials is messy, unclanned, unsupervised and unsate.



PICKUP OF 100 TONS is made by a Manitowoo Model 4500 crawler crane as it lifts a 91-ft kiln section, 10 ft in dia. Crane is walking of concrete supporting pedestals.

the steel kiln forward over a level timber roadway to place it on top

Crawler Crane Places 100-Ton Kiln

ONE HUNDRED TONS of machinery all in one piece is a big lift for any equipment. When it is lifted by a single crawler crane, it ranks with the heaviest work handled by a crawler-mounted unit.

Such a lift was made recently during the installation of a 340-ft cement kiln for the Medusa Portland Cement Co. at Manitowoc, Wis. The McDowell Co., Inc., of Cleveland, has the contract for

erection of buildings and installation of machinery in a \$2,500,000 expansion program for the cement company.

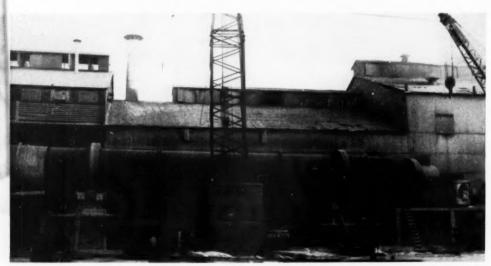
The 100-ton piece is one of four lengths into which the rotating kiln, 10 ft in dia, was fabricated originally. This section is 91 ft long and made of %-in. steel plate. Two heavy tires, on which the kiln will roll, added considerably to the weight.



TIGHT SPOT between foundation pedestal and duct to new smoke stack calls for extra care in maneuvering with an 83-ft section, weighing 72 tons. It was placed at a 33-ft radius. For these heavy loads and precision handling, the big Speedcrane moved on timber footings.



LOWERING AND PLACING of one of the smaller sections is relatively easy after it has been threaded safely around obstructions.



LET-DOWN ON ROLLERS that support rotating kiln is a precise operation. This was the last of four sections to be placed, after

which they were joined by welding. Cap section at right angle end is mounted on wheels for rolling into position.

A Manitowoc Model 4500 crawler crane made the lift at a 20-ft radius. It was equipped with an 87-ft, all-steel erection boom, and load blocks rigged to give a 10-part main load line. The other main line was run from the boom point to a snatch block ahead of the foundation to act as a safety line for the boom at its minimum radius.

Foundation pedestals made it

necessary to lift the section to the full height of about 30 ft then the crane walked the load into its final position. A level roadway made of 12x12 timbers gave the crane solid footing and kept the load from swaying beyond the machine's safe operating radius.

The other three sections of the kiln were approximately 83 ft long, with an average weight of 72 tons. These were set earlier by the Manitowoc at radii up to 33 ft. Here, even more careful planning and smoothness were needed by the McDowell organization because of the close quarters between the supporting foundation and the ducts and supports for the new 300-ft stack.

By setting the kiln in large sections, it was mounted complete in only four working days, ready for final welding of the three joints.

Crane Quartet Harmonizes on Bridge





1 PEDESTRIAN OVERPASS across The King's Highway, south of San Francisco, no longer in use, is about to be lifted off its end supports where the timber beams have been sawed through. Four Lorain Moto-Cranes have been positioned in pairs at each end and their slings attached. Traffic still is rolling on highway.



ROAD IS BLOCKED temporarily when cranes lower footbridge to the ground and regroup in new positions at the ends of the span to pass it through a gate into a parking lot for subsequent dismantling. Gate is about 100 ft away from bridge site. Overpass was used during war by Navy personnel.

4 OPERATOR SKILL and all-around coordination thread the unwieldy load through the gate and deposit it in the parking lot, with little delay of highway traffic. Supervisor of the job was Bill Frazer (standing near bridge), foreman for Waren Ballinger, owner of one of the Moto-Cranes.



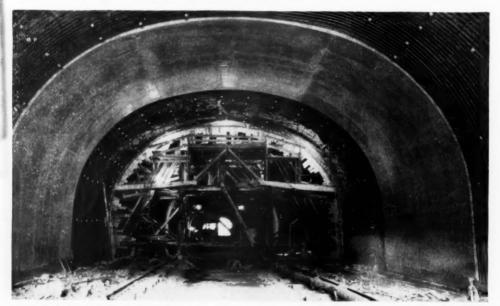


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TUNNEL LINING FORM for Queen Creek highway tunnel in for first pour, after which they are alternated through the 1,200-ft Arizona is erected outside portal. Second 30-ft form is in position bore. Forms are left in place 72 hr after a pour.

Two Forms Alternate...



This one poured section shown in place. Mix is supplied from portal

HEADERBOARDS ON FORM take care of irregular rock surfaces. by Rex Pumpcrete machine. Two steel rails on tunnel floor support wide-span form and make convenient track for moving.

. to Line 42-Foot Bore

TWO SETS of tunnel lining forms are being used by the Vinson Construction Co. to line the 1,200-ft. long Queen Creek highway tunnel in Arizona. The completed bore will be 42 ft wide by 22 ft 10 in. high. (For tunnel-driving story see CM&E March '51, page 86).

Two sets of forms are used to speed the work. One set has header boards on each end that are adjustable to fit the irregular shape of the tunnel rock. Headerboards are set vertically, whereas the lining form follows the 6.4% grade of the tunnel. The first form lines alternate 30-ft sections of the work. The second form has plate extensions that fit against the previously poured concrete.

For moving, the crown of a form is retracted 6 in. below casting position by telescopic legs on the two longitudinal bents. Sidewalls are pulled slightly inward by hydraulic jacks.

The forms move on two rails set at about the third points. Some of the weight is transferred to rails on the curbs during pouring.

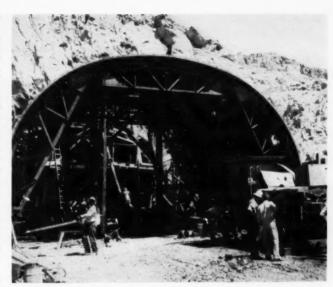
Concrete is pumped behind the forms by Rex Pumpcrete machines. It is batched in a Blaw-Knox plant, mixed in truck-mixers, and fed from the mixers to the Pumpcrete machine by a Scoopmobile.

Forms are left in place for 72 hr after a pour and then moved ahead. The form with headboards places odd-numbered panels and, after several of these have been poured, the second form is moved in to follow up with the even-numbered panels.

Fault Dictates Lining

Vinson's contract is separate from the tunnel excavation contract held by Fisher Construction Co. That's because Arizona highway officials hoped to get by without supporting the tunnel. However, a fault encountered during construction caved, trapped a power shovel, tractor and truck. A 105-ft long patch was applied to the fault. The patch included structural steel ribs topped by block set timbering. The steel was encased in a 3-ft cap of pumice concrete, and bagged perlite was placed atop this as a cushion.

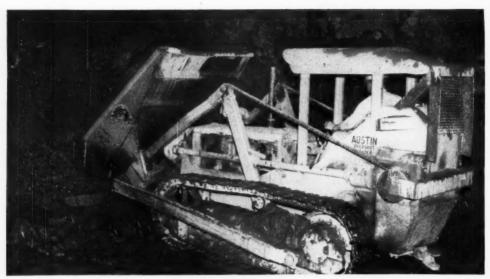
The steel forms were built by the Allison Steel Manufacturing Co. of Phoenix. Supervising the work for Vinson is L. V. MulHarron. Ray Gardner is resident engineer for the Arizona Highway Department.



SETTING UP for the first pour. The first form is in place at tunnel entrance and concrete delivery pipe is being coupled. Form in foreground will follow alternately.



DUMPING CONCRETE into Pumpcrete machine with skip of Wagner Scoopmobile. Truck mixers bring concrete from the job's Blaw-Knox batch plant and unload into Scoopmobile.



Austin Overshot Loader on Cat D-4 digs into muck pile...

Photos by Frank H Spines Danves



... And backs up to load into Koehring Dumptor in mucking out...

Big Tunnel Drilled From Rubber-Tired Jumbo

IN RUGGED BOULDER CANYON 5 mi. above Boulder, Colo., Low-dermilk Bros. of Denver are driving a large, but short, highway tunnel with a tractor-handled, trailer-mounted jumbo and an Austin Overshot Loader mucking out into Koehring Dumptors. The tunnel, 30 ft. wide, 22 ft. high with an arched roof, and 320 ft. long, is part of Lowdermilk's contract with the Colorado State Highway Dept. for improvement of a section of the Boulder-Nederland road.

J. H. Johnson, superintendent for the contractor, built a 3-deck jumbo on the frame of a dual-axle semi-trailer. All three decks have folding sidewings. The trailer is hooked to a veteran Caterpillar 75 diesel tractor. (Can you name the age of that rig?) Mounted on the tractor is a 350-ft. Gardner-Denver compressor V-belt driven from the power take-off. Additional air is supplied by portable compressors at the portal. A big air receiver is carried on the front end of the jumbo trailer.

Jumbo Mounts 12 Drills

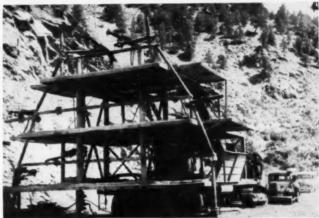
The jumbo mounts 8 Ingersoll-Rand and 4 Gardner Denver drifters, all supported by conventional columns and bars. At the time we visited the job late in July, operations were just getting lined up after turning the heading off the portal, and the hole had advanced some 60 ft. At that time only 8 drills were in use because of lack of air, but more compressor capacity was being set up to handle the full complement of 12 drills.

The rock is a hard granite, but drills and breaks nicely. Test drilling had revealed that no timbering would be necessary. A typical round is 130 holes, drilled 11 ft. deep with Timken carbide detachable bits. Later the contractor expects to drill 13-ft. holes DuPont Gelex, 60%, is loaded at the rate of 3 lb. per cu. yd. of rock, fired in 10 delays. Drilling with the 8 drifters takes about 5 hr.

Muck is neatly handled by an Austin Overshot Loader mounted on a Cat D-4 tractor, loading into 3 Koehring Dumptors for a 4,000-ft. haul to a new highway fill. This rig works fine, but the contractor says it is a little light for the job, and he wishes he had this same 1-yd. bucket on a Cat D-6.

The tunnel will be lined at the portals only, 25 ft. at one end, 15 ft. at the other. The rest of the heading will be treated with Gunite







RUBBER-MOUNTED JUMBO carrying 12 drifters is built on bedframe of semi-trailer. Each of three decks has folding wings at side. Diesel tractor, with air compressor driven from power take-off, maneuvers jumbo to place against face and furnishes part of air required by drills. Big air receiver is mounted on front of jumbo trailer. Round of 130 holes is driven with this set-up.



Bridges and tunnels...

Only 12 mi from start of line, railroaders bore 2,250-ft tunnel and build 708-ft bridge 130 ft above Moise River. Both are now complete. Construction cableway had to be strung by helicopter.



Rock outcrops ...

Even after line works up out of valleys on to Labrador Plateau, rock has to be contended with. Drills and compressor, as well as lube truck (rear) had to be flown in to remote job.



Ice-blocked harbor...

All supplies and equipment for project can be delivered by air and water only. So when St. Lawrence River froze, this freighter had to unload 11/4 mi offshore from job base at Seven Islands, Que.



Supply by air...
Railroad job runs 360 mi due north from isolated village on lower St. Lawrence, traversing virgin territory all the way, so air lift is vital. Such varied things as oranges, oil and tarps will join this 2,100-lb welding machine for 55-mi DC3 flight.



Remote repairs ...

Heavy machines far out on the line must be repaired where they are. Jacks and chain hoists make the heavy lifts without crane.

Railroad Bucks Rugged Conditions



Cross-country travel...

Construction machinery can move overland to new work sites, in some cases, but often only in winter when ground is firmer. Except near contractor's main base, there were no roads in area at all at start of job.



Direk Sies

Biting and stinging insects are often so bad that men must wear head nets. Project uses fly dope by the hundreds of gallons.



Spring ice jams...

Break-up of river ice damages cofferdam, and also carried away temporary bridges on contractor's tote road. These rock-filled timber cribs are at Menihek Dam, 328 mi up the line, which will generate power for mines and also carry railroad across Ashuanipi River.



Frozen muskea...

In winter, muskeg has to be rooted before it can be dug out. In summer, however, it is too soft to support heavy earthmovers.



Steep rock slopes...

Hard rock requires plenty of drilling and blasting, and there's plenty of rock on the job. Miles of line had to be benched into the sides of narrow, steep-walled and deep river valleys. These latter cuts were taken down in 18-ft lifts with wagon drills.



Big culverts ...

More than 80,000 ft of 24- to 144-in. corrugated culvert is required, most of it flown in. This 120-incher will be 174 ft long.

to Tap Labrador Iron

Text begins on next page

Rails to Labrador: A Fight All the Way

By HENRY T. PEREZ, Senior Associate Editor

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SEVENDO

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RICH IRON DEPOSITS, which rival the Mesabi in both quantity and quality, are the goal toward which railroad is being ramrodded at fast pace. First ore will come over the line in 1954.

THE DAYS OF RAILROAD PIONEERING are not over, by a long shot. A Canadian contractor combine known as CMMK will attest to that: They're pushing a line 360 mi due north from the lower St. Lawrence River to tap rich iron ore deposits in Labrador and the Ungava region of Quebec (see map). It's a bitter struggle most of the way—steep rock gorges to be benched, long stretches of muskeg to cross, two hills to tunnel and a couple of dozen rivers to bridge. And because the job is all in virgin territory, the great majority of men and machines must be flown in to the work sites and kept supplied by an air lift that operates night and day.

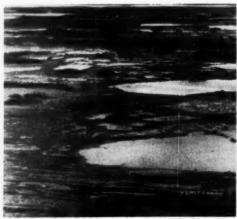
The single-track standard-gage line, the Quebec, North Shore & Labrador Ry., is being built for the Iron Ore Co. of Canada (IOC). General contractors are Cartier Construction Ltd., Montreal; McNamara Construction Co. Ltd., Toronto; Fred Mannix & Co. Ltd., Calgary and Morrison-Knudsen Co. of Canada Ltd. (and they won't say whose M is missing from CMMK). The railway's top man on the job is Hector MacNeil, chief engineer, while Jim Pickard is contractor's project manager. CMMK is also building two power dams, a 1,600-ft wharf, ore-handling facilities and terminal yards.

With preliminary work begun late in 1950, railway construction was well under way last year (CM&E, August 1951, page 40). By this July 1st, 166 mi of right of way had been cleared and 111 mi of grade had been completed. Steel should be laid as far as Mile 190 in December. And an already tight completion schedule has been advanced from 1954 to the end of 1953.

How was this accelerated progress obtained? Not through any special cooperation from Nature. In (Continued on page 66)



SOUTHERN SECTION OF LINE follows river valleys, is typified by heavy sidehill cuts. These deep ones are in gravel, but many are in solid rock. All are remote from civilization.



NORTHERN SECTION OF LINE strikes across Labrador Plateau, is typified by waterlogged land and long stretches of muskeg. Almost lost in foreground, a dragline inches forward.

Page 64 — CONSTRUCTION Methods and Equipment — September 1952

The Heiliner grades, spreads, loads, hauls, dumps...with help of TIMKEN*bearings

THE Heiliner-Scraper is a versatile earth-moving tool. With cutting blade in one position it grades and spreads. A quick change in blade position and it picks up a load of dirt, hauls it at high speed and dumps it at the discharge point. To do these five jobs on rough terrain day in, day out without costly breakdowns takes plenty of stamina.

One of the ways Heil insures rugged dependability in its tractor and scraper is by mounting vital parts on Timken* tapered roller bearings. In the tractor's differential and on its pinion shaft and engine shaft, Timken bearings insure accurate gear meshing, reduce wear. That's because the tapered construction of Timken bearings enables them to take radial and thrust loads in any combination. Shafts are held in accurate alignment, a smooth flow of power is insured.

On both the tractor and scraper wheels Timken bearings are more than a match for heavy shock loads. Line contact between rollers and races in Timken bearings provides load carrying capacity to spare. And with Timken bearings on the scraper cable winch sheaves, cable wear is minimized because sheaves turn freely.

Timken bearings make closures more effective because they keep housing and shafts concentric. Lubricant stays in—dirt stays out.

No other bearing can give you all the advantages you get with Timken bearings. Make sure you have them in the equipment you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means





GREATER LOAD AREA

Because the load is carried on the time of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design: 2. precision manufactoring: 3. rigid quality control; 4. special analysis steels.





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LABRADOR RAILWAY . . . Continued from page 64



AIR STRIP AND CAMP are nestled between railroad right-of-way and river. Contractor's 5,000-ft runways are of gravel and in choice spots, are dressed by a grader once a week.

winter she still skidded temperatures to 58 below zero, yet left soft spots in lake ice through which tractors sank on their journeys north to new points of attack on the line. In the spring she loosed ice floes that carried away the cofferdam at one of the damsites and destroyed the job's steamship unloading pier at Seven Islands. And in summer she sent her usual plague of voracious mosquitoes and biting black flies.

Nor, except for a new tracklaying scheme now being tried, has the good progress been due to any revolutionary construction procedures or unusual equipment. Rather, it is because of intelligent -and continuing-advance planning that has insured the right machines being available at the right place at the right time. Coupled with this is the fact that able equipment maintenance crews have kept the scattered machines operating efficiently, often through improvising parts and attachments. But above all is the efficient air lift that is the life-line of the job. as it is now set up.

Muzzle Loader

The job, because there was no access to any of the line except at its lower terminus, is essentially a muzzle-loader—start it at the southern end and ramrod it north through the wilderness. In itself, of course, this is a confining and slow procedure. So, instead, while still retaining the general principle of advancing the work in a continuous line so supplies later can be carried up over the railroad

subgrade, and tracklaying facilitated, the grading job is also being attacked at other points farther along. When grading on one of these stretches is completed, the equipment spread is leapfrogged northward to start again.

The difficulty of getting equipment to these spots is formidable. In the first place, Seven Islands itself can be reached only by air or water, and the harbor is iceblocked in winter. From here on up, machines and supplies must be hauled over a temporary winter tote road or flown in to landing strips CMMK has hacked out at intervals alongside the railroad right of way.

Had it been feasible to build a complete all-weather tote road in advance, which of course would have been just about as tough as the railroad job itself, access along the line would have been simple. But land travel for any great distance in that rugged country is possible only in winter. Then the myriad streams, lakes and stretches of muskeg are frozen solid enough to carry the heavy machines. So, during the first winter, equipment was hauled in and spotted at various points up to Mile 40. Last winter some was moved overland as far as Mile 197. An all-season haul road has now been pushed to Mile 134, but much of it runs on completed railroad subgrade.

Machines to build the air strips were also moved in over ice and frozen ground, or by planes landing on the ice. Small dozers to start some of the strips were fer-

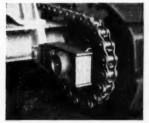
(Continued on page 70)

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- Pin-Connected Boom



Crawler outboard bearing assembly

It isn't unusual to find two or more BAY CITY machines teaming up for bigger profit possibilities because so many BAY CITY owners have been repeat buyers for up to 35 years. And, it isn't unusual to find scores of BAY CITY shovels, cranes and draglines with records of 20 to 25 years of service. No single factor makes them so long-wearing ... so long lasting. It is a combination of heavy-duty design and construction features that contribute to this extremely long life and satisfactory service.

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EXCLUSIVE ACROW SELF-CLEANING FEATURE makes possible rapid stripping operations. A unique patented extension of the collar nut extends over a segment of the threaded tube (see left). When collar handle is turned in stripping operation, encrusted concrete, dirt, and grit are removed from the thread-making ACROWS instantly ready for use on the next job.

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Shore Sizes, Dimensions, Weights, and Capacities							
Size No.	Height		Weight	Failing Load		Recommended Safe Working Load	
	Fully Closed	Fully Extended	in lbs.	Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 21/2 in.	12 ft. 51/2 in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5225 lbs.	2050 lbs.

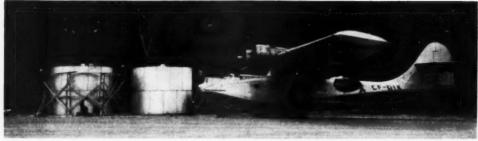
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AIR-LIFTED FUEL is unloaded from amphibious tanker to bulk storage. Tank trucks will deliver it to scattered construction rigs out

on the line. Air fleet also includes five DC3's, one converted Lancaster bomber, one C46 and numerous float planes.



because there's a tractor out in front with a Carco "G" Winch, providing ample reserve power for grades or rocky soil. The winch also serves as key equipment on river crossings. Houston Contracting Co., laying this pipeline in eastern Texas, has 12 tractors equipped with Carco "G" Winches.

CARCO Winches for all makes of tractors Because Carco builds more tractor winches than any other manufacturer, and for more makes of tractors, you're always close to a Carco dealer with parts, service, full data on any model.

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ried in by flying boat in summer. Then, too, it was possible to move heavy equipment overland from some airstrips to build others.

At present there are 12 gravel air strips along the line, although some have been practically abandoned because railroad grading has advanced beyond them. After a strip was built, more men and machines-and the supplies they each needed-were flown in to start on a stretch of railroad. Workhorses in this operation were Douglas DC3s that carried payloads in the neighborhood of 8,000 lb. The construction equipment was simply cut with a torch into pieces small enough and light enough to fit in the plane, then was welded whole again after delivery.

By Way of Camps

Generally, a major construction camp is established near each operating air strip. Railroad grading is pushed both ways from the camp, and smaller fly camps are set up beyond this one as the work stretches out. In late July, eight major camps and sixteen fly camps were in operation.

Most of the railroad grading operations have just been straight-forward hard work—and plenty of it. By this midyear, more than 7½ million yards (of a total 13½ million) had already been handled. Near the lower end of the line, much of this was solid rock. On one 5-mi stretch along the Moise River, for example, 400,000 yd of rock had to be excavated to bench the line into the steep valley wall. And this entire section could be attacked only from each end because of the impossibility of lateral access.

The job kept operating over the winter, principally on excavation. Rock work posed no special prob-

lems. But in earth cuts, it generally was necessary first to break the frost cap by blasting.

Much of the work is now in muskeg. This averages 4 ft deep, but fortunately lies directly on good sand and gravel. The muskeg is not removed from track centerline. Instead, a dragline on each side advances along the ditch line. stripping and spoiling the muskeg in its path. Operating on firm base thus exposed, the rig reaches behind to dig the sand and gravel it has just traveled over. This borrow material is cast to the center to make the embankment. The muskeg on which it is dumped simply compresses to a thin, nontroublesome layer.

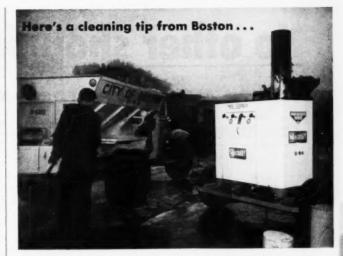
Tracklaying was begun in earnest this year. It is being handled in somewhat standard fashion: Alternate ties are placed ahead on the subgrade; a track crane sets individual rails; temporary transverse bar bridles are wedged on to clamp each rail to its parallel mate; the crane advances over the rails just laid; and follow-up gangs slip in the rest of the ties, bolt the splice bars, place the tie plates, and gage and spike the rails. Progress by this method is some 5,000 ft per day. However, CMMK is now working on a scheme for laving track in pre-assembled rail-length panels, complete with ties, that should up daily progress considerably.

Big Equipment Inventory

CMMK's contract is unusual. While it's on a cost-plus-fixed-fee basis, target unit prices have been set up—the contractor sharing in any savings made in beating them. Also, while the contractor can specify what is needed in the way of equipment, most of the machines are bought by the ore company. IOC retains title to them but turns them over to CMMK for operation and maintenance. The contractor furnishes most of the smaller items (costing less than \$1,000, roughly) and equipment used on wharf and power-plant construction.

At midyear, there was \$10 million worth of construction equipment on the \$70-million job, some \$8% million of it owned by IOC.

Total number of machines was 1,625, including: 43 shovels and draglines (%- to 2½-yd), 104 tractors (up to D8s, HD-20s and TD-24s), 154 dump trucks (to 10-yd), 62 compressors (to 500-cfm), 233 wagon drills and jack-hammers, 121 light plants (up to (Continued on page 74)



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See for yourself how Malsbary exclusive patented pumping system delivers 2 to 4 times more pressure than steam vapor cleaners; thus enables you to do jobs with Malsbary that other cleaners can't touch. For demonstration, fill in coupon NOW. No obligation.

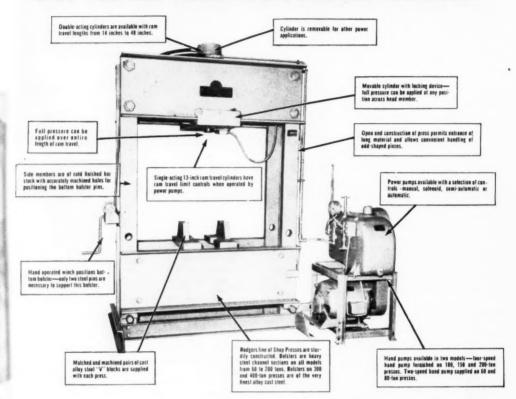
3 heavy-duty models — 250, 300, 500. Oil or gas fired; gas engine or electric drive; stationary, portable or trailer mount. All develop hot solution in 2 to 3 minutes.



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formance, high efficiency and long, trouble-free service. Many other important features of Rodgers Shop Presses are shown in the new illustrated Catalog No. 313A. Write today for your free copy and then compare—point for point—feature for feature.



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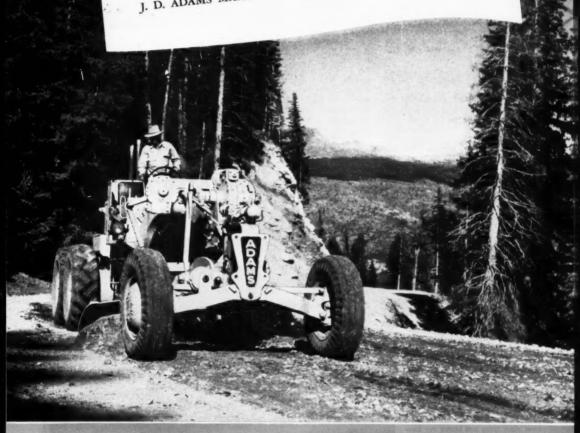
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and this applies to all types of heavy highway construction—grading, road mixing, scarifying, etc. We find the Adams has more weight for increased traction, better stability, greater over-all dirt-moving capacity and plenty of power to handle all jobs easily." So reports Northwestern Engineering Co., Denver, Colorado.

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Make your next motor grader an





TIES ARE PLACED on completed railroad grade after delivery by Dumptors. For extra speed, only alternate ties are spotted in this operation, rest will be set after rail is laid.



RAIL IS LAID by Burro track crane that pulls supply car behind it. Main-line rail is 132-lb section, heavier than any other in Canada. Passing tracks take only 100-lb rail.

125-kw), 31 welding machines (to 600-amp).

For repair and service of the machines, a \$2-million stock of spare parts is kept on hand. Yet even this has to be augmented by job-built parts when commercial items are unobtainable. For ex-

ample, when new tracks for one make tractor could not be found due to a basic shortage, CMMK mechanical superintendent Phil Bergeron devised a method of adapting those of other manufacturers. (An article describing this will be published in a future issue.)

Main repair facilities are at CMMK's Seven Islands headquarters, where a complete machine shop has been set up. Equipment maintenance shops are established at each of the major field camps to handle servicing, parts replacements and minor repairs. These

STANG DEWATERS 65' DEEP 300'x 400'EXCAVATION FOR LIMESTONE MINE

Above—Flooded excavation of shaft for limestone mine, prior to installation of Sand Piles and Stang Wellpoints.

After heavy rain and snow, the banks of a 300° x 400° excavation, 65° deep, for the Mississippi Lime Company, became unstable as the groundwater table rose. Stang engineers recommended sand piles to drain water vertically down to the 20° layer of river sand lying just above the limestone. When the upper banks had been successfully stabilized, Stang Wellpoints were installed on top of the river sand, speedily dewatering it so that final excavation could proceed in the dry. Specially designed "shorty" wellpoints were used for this job.



Digging dry river sand predrained by Stang Wellpoints.

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TRACK IS SPIKED by follow-up gang with Ingersoll-Rand drivers and rail-mounted compressor. Similarly equipped crew has preceded this one and has completed spiking the gage rail.



QUARRY IS OPENED UP alongside line to furnish rock fill for ore dock. Bucyrus-Erie 54B shovel works the pit. Track ballast is coming from gravel deposits farther up the line.

shops are fitted with such tools as welders, grinders and drills. The fly camps are equipped to do routine servicing of the machines assigned them.

The equipment operated by each camp varies, of course. But as an example, one 65-man fly camp was

working in July with five tractorscrapers (HD-20s with Carryalls and D6s with No. 60 pans), four bulldozers (D6, D8s and a Tournadozer), two draglines (1½-yd Dominions) and three trucks (4wheel drive GMCs). Working directly out of the major camp, of which this fly camp was a subsidiary, was a somewhat similar equipment spread. It consisted of four tractors and pans, five dozers, three ¾-yd draglines, one 1½-yd shovel, eight trucks and four half-tracks.

CMMK employs some 3,500 per-

at the

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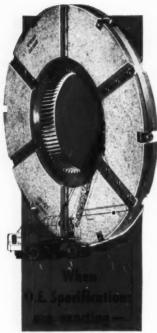


Looking for a good asphalt plant combustion system? Let Mr. M. V. Carmody, Vice President of the Globe Construction Co., tell you about Hopkins Volcanic equipment: "We used our first Hopkins equipment during the 1950 paving season—the Hopkins Motor Blower with Hopkins Volcanic Burners—for atomizing fuel oil by low pressure air instead of by steam, in our asphalt plant aggregate drier. At the time of purchase, it was indicated that the units would reduce our fuel oil consumption by 25% on the drying operation. The result was a saving of over 25% in fuel oil used.

"On the strength of last year's operation, we purchased two more units for our other plants, one of which uses oil for fuel and the other, natural gas. They are both working out very satisfactorily."

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High output on tough jobs . . . extra yardage that completes tight schedules on time . . . These are demands which Michigan Power Shovels and Cranes face every day, all year 'round.

Small wonder that Michigan's engineers chose Thermoid to help them develop a new single disc, double face, 12-segment clutch! With over 70 years experience in making friction materials for special applications like this, Thermoid was able to produce a long wearing, stable friction clutch segment which is ideal for the heat compensating and quick-change features of Michigan's clutches.

Thermoid makes a complete line of woven, molded and special types of Clutch Facings. Superior construction, plus Thermoid's close attention to individual needs, makes Thermoid Clutch Facings the choice of leading manufacturers in many fields.



Thermoid Company, Trenton, N. J.



CUT IS EXCAVATED far up the line after equipment was flown in. This air-lifted Dominion $1\frac{1}{2}$ -yd shovel loads GMC trucks. Frills like new radiator grille are dispensed with here.

sons on the job. Most are from the Canadian mainland, but 5-600 have been recruited from Newfoundland and a like number are DPs from Europe. ("My league of nations", Jim Pickard calls it). Wage rates range from \$0.90 per hr for laborers to \$1.85 for shovel operators. While the project works two 10-hr shifts, men are paid straight time only. And, to induce them to stick with the job, they are given a bonus if they work up until December 15th. The extra payment is \$0.50 per day for laborers, rising to \$1.00 for shovel runners.

Subsistence costs about \$3.50 per man per day, but the men are only charged \$1.50—CMMK absorbing the rest of the cost. The men are housed mostly in skid-mounted shacks or wood-floored tents. The first major field camps were of prefab plywood buildings fitted with such conveniences as steam heat and sewerage. However, when it

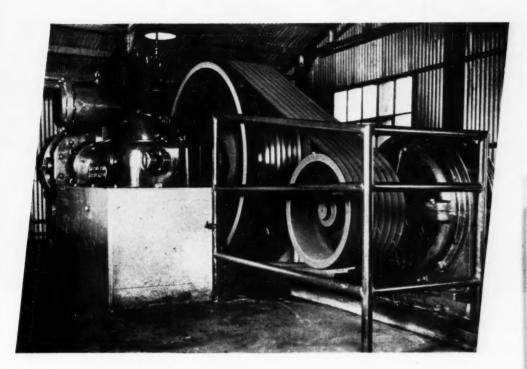
came time to strike camp, a setup like this proved too difficult to disassemble and move ahead; hence the switch.

The air lift, in 1951, handled more than 14,000 tons of job cargo (2,425,000 ton-mi) and 22,000 passengers. A like amount was ferried in in just the first seven months of this year—July alone accounting for 2,500 tons and 5,000 passengers. Some 60,000 bags of cement, for example, were flown to Menihek damsite in three months. And at the same time, all the rest of the work was kept supplied with such things as men and food, gas, oil, diesel fuel, parts, tools and machines.

With costs averaging more than a nickel a pound, the air lift comes high. But it does keep the 360-mi rail job moving. And moving, it is—in high gear, through rugged, virgin territory. The pay-off is the speeded-up completion in 1953.



EMBANKMENT IS BUILT by Caterpillar D6 dozer that pushes spoil from cut out on to muskeg. In background, a Dominion ¾-yd dragline excavates muck for culvert under the fill.



Keep your production in the groove with Thermoid V-Belts

Production men, in all kinds of industries, rely on the greater strength and longer life in Thermoid V-Belts to provide smooth, efficient performance and long wear . . . keep production in the groove.

From huge multiple V-Belts of rayon grommet construction to the smallest fractional horsepower belts, you can always depend on Thermoid quality.

The result is V-Belts with minimum stretch and extreme flexibility . . . designed to transmit maximum power without slippage . . . able to withstand high speeds and absorb shock.

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Call your nearest Thermoid distributor today. He has a complete range of sizes to meet your requirements. And for your special V-Belt problems, experienced Thermoid Sales Engineers are always ready to help you.



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20. Engineering on the Project

By DAN K. HEIPLE, Chief Field Engineer, R. G. LeTourneau, Inc.

IT IS FITTING that articles on the business of earthmoving also present, in ordinary terms, the general procedure used in the layout and construction of an earthmoving project.

No attempt is made here to cover all the items involved in the work or all the problems that confront an engineer on such a project. Rather, the material is presented so that a person without previous experience, after a study of the information, can observe a project of this nature and gain an understanding of what is going on. Or, if familiar with earthmoving, he should be able to make recommendations or obtain enough information to determine the correct equipment to be employed on the various phases of construction.

The principles of surveys, stakes, volumes, and mass diagrams are equally valid for roads, airfields, dams, levees or other grading projects.

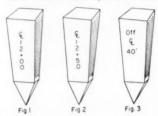
Every engineering project necessitates some surveying. Before plans and estimates are prepared, boundaries are determined and the topography of the site ascertained. Upon the completion of plans, structures must be staked out on the ground and, as the work progresses, lines and grades must be given so that the finished construction will conform with the plans.

The majority of this surveying falls within the province of the engineer. But there are some aspects of the job that are of interest and concern to the average dirt mover.

The survey itself is a system of horizontal and vertical measurements. As a general rule, the survey will run from South to North and from West to East. It involves the location of certain points on or near the earth's surface, the measurement of horizontal and vertical distances and angles, and with the establishment of points by directional, angular and linear measurements.

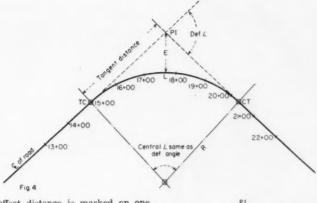
This is the final chapter in a series of 20 consecutive articles on earthmoving.

Surveyor's Stakes—In most continuous traverses, an engineer's transit and 100-ft steel tape are used to measure distances from the survey point of origin. These distances are marked by center line



stakes at 100-ft intervals, called full stations. Points between stations are noted by plus stations; thus, in Fig. 1, the station is 1,200 ft from the starting point while Fig. 2 shows the station is 1,250 ft from origin.

If the job is such that these stakes would be destroyed by progress of the work if placed on the center line, they are offset to the outside limits of the work, and the



offset distance is marked on one face and the station on the opposite face of the stake (Fig. 3).

In a survey, all straight lines are called tangents, as they are simply tangent to the connecting curves. The transit and 100-ft tape or chain are used to lay down straight lines and run curves. Center line stakes continue in an unbroken line around curves.

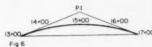
A simple horizontal curve is illustrated in Fig. 4.

The degree of curve is defined as the angle at the center subtended by a 100-ft arc on the curve, and a 1-deg curve has a radius of 5,730 ft (Fig. 5). The radius of any given



degree of curve = the radius of a 1-deg curve divided by the given degree of curve. For example, a 3-deg curve will have 1/3 the radius of the 1-deg curve or 1,910 ft.

Vertical Curves — When grades change from one rate of grade to another, the two grade lines are connected by a curved line. This line is called a vertical curve. This curve generally is laid out to extend an equal number of stations on each side of the vertex or PI as in Fig. 6.



Slope Stakes—Before construction work can begin, slope stakes must be set to guide the contractor. At every full station, and at intermediate points where the longitudinal slope of ground changes and at points required by special structures, a slope stake is set on each side of the center line at a point where the side slope of a cut or fill will intersect the ground surface.

Stakes are driven at points of no cut or fill and are set with dumpy level and 100-ft steel tape or chain. Their purpose is to define the limits of grading work and areas of clearing and grubbing.

It is customary to slant the face of the stake slightly toward the center line when driving a cut slope stake and slightly away from the center line for a fill section. The numerals on the face of each stake indicate the amount of cut or fill at locations in relation to the subgrade elevation at the center line opposite it.

The engineer and project manager usually agree on a standard offset distance for reference stakes at the start of a project. Reference stakes permit the grade foreman with rod and plumb-bob to replace knocked-out slope stakes.

Fig. 7 (page 82) illustrates the setting of stakes for a roadbed. Similar methods would be used for runways, dams or levees.

Grades and Gradelines—Grades are referred to in percent. For example: +1% grade is uphill at the rate of 1 ft per 100 ft of horizontal distance, while a minus 1.50% grade is downhill at the rate

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The LOW-COST machine with the BIG earning range

EARTHMOVING . . . Continued

of 1.5 ft per 100 ft of horizontal distance.

Slopes In Degrees

1% grade =	0°	34.4 ft
5% grade =	20	51.7 ft
10% grade = .	5°	42.6 ft
20% grade =	11°	18.6 ft
25% grade =	14°	2.2 ft
45% grade =	24°	13.7 ft
75% grade =	36°	52.5 ft
100% grade -	45°	

The grade line is referred to as a plus or minus grade—plus when going up, minus when going down in the direction of the station number. The difference in elevation of the ground and the grade line will indicate the cut or fill at any section of the road.

Standard Grading Plant—The plan usually is drawn on printed sheets of drawing paper ruled to a scale of one inch being equal to 100 ft horizontal and 10 ft vertical. The upper half will show the center line of the project made up of tangents and curves, right-of-way lines, drainage information and all topography that will effect the design.

The lower half shows a profile of the ground line along the center line and the grade line at the center line. These ground and grade lines are placed so that the cut and fill may be picked off the profile. Fig. 8 (page 82) illustrates how this is accomplished for a small section of road relocation.

Note that: (1) Actual elevation of the ground and grade line are noted at the lower edge of the sheet; (2) where the grade line changes from one rate of grade to another, the grade lines are connected by a vertical curve; (3) the profile shows the distribution of earth by balance points showing the number of cubic yards of cut and fill and direction of haul.

Determining Volumes for Earthwork

The Cross Section—A set of crosssection sheets accompany each construction plan. These sheets are constructed as follows:

- 1. Scale 1 in. = 10 ft both horizontal and vertical or 1 in. = 5 ft both horizontal and vertical.
- 2. Cross-sections are taken at each station and plus station at right angles to the center line.
- 3. The cross-section shows the (Continued on page 82)



Ford BIG JOBS feature an overhead valve, Low-Friction Cargo King V-8
-145 h.p. (F-7) and 155 h.p. (F-8).

WISCONSIN Report No. 11312

"I haul loads averaging 11 tons, yet my running costs are

says Ed Schuster, Green Bay, Wisconsin

"I operate a number of trucks," says Mr. Schuster, "and our Ford tandem conversions have done a remarkable job. We have lots of power and gas mileage is above average. We are well satisfied." This F-7 with special dual drive axle traveled 14,494 miles in the Economy Run. Costs for gas, oil and maintenance were \$738.87, or only 5.1 cents a mile!



Now! Up to 14% more Gas Savings



Two years of testing show how well the new Ford Low-Friction engines perform under the most severe conditions. They passed scores of 100-hour "destruction" tests. One model alone ran as much as 50,000 dynamometer test-hours, over 500,000 vehicle test-miles

DON'T GUESS! See how little it can cost to run a truck in your kind of work. See the cost figures in this 144-page book showing results from the 50-million-mile Ford Truck Economy Run. See it at your Ford Dealer's!



FORD TRUCKING COSTS LESS and FORD TRUCKS LAST LONGER!

Using latest registration data on 8,069,000 trucks, life insurance experts prove Ford Trucks last longer!

and more Speed Hauling power, too!

New Low-Friction design in 3 new Ford Truck high-compression engines cuts friction loss!

Ford's Low-Friction design cuts friction power loss up to 30%! A new Short-Stroke principle reduces piston travel up to 20% -makes for longer engine life. New OVERHEAD VALVES give more efficient fuel-feeding. New High-Com-PRESSION gives extra power on regular grade gasoline.

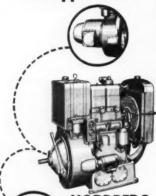
You can get new Low-Friction design in 3 of the 5 great Ford Truck engines for '52. And you get more power than ever in the famous 239 cu. in. truck V-8 or the 254 cu. in. BIG SIX. See what's new in trucks at your Ford Dealer's!

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Please send me with details on the new great Ford Truck e	nout charge or obligation, complete Ford Trucks for '52 and the five ngines!	
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Built in 1, 2, and 3-cylinder sizes from 10 to 45 hp, these heavy duty medium speed units are available as straight power units with stub shaft or clutch power take off—as packaged generator sets producing from 6 to 30 K.W.—and as "packaged" centrif-ugal pumping units. Send the coupon today for more

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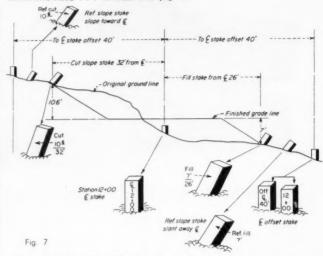
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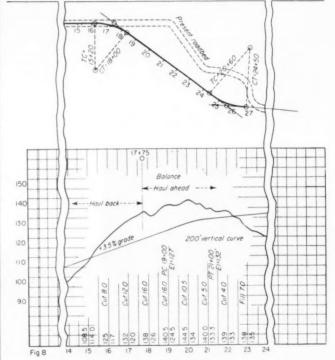
Nordberg Mfg. Co. Milwaukee, Wis.

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Please send literature describing the full line of Nordberg "4F5" Diesel Power Units.

EARTHMOVING . . . Continued from page 80





ground line and finished runway, levee, dam or road section.

- 4. Area of section in square feet and distance between the sections in feet are noted.
- 5. The cubic yards of excavation are calculated by what is called the average end area method.

Formula:

 $V = A_1 + A_2 \times D$

Where:

A. & A. = Area in square feet of the two sections, obtained by planimeter or counting the squares, (Continued on page 86)



Any way you look at it ... IT'S A TOUGH GRADE

yet BIG BUDA diesels are cutting haulage costs every day!

14 Buda-powered haulage units are roaring up this tough grade . . . 2/10 of a mile with 5 switchback turns . . . hauling payloads up to 22 tons in faster time at a considerable reduction of their former cost.

The extra horsepower and 13 to 25% more displacement . . . greater lugging ability with 9 to 23% more torque of BIG Buda Diesels is paying off at this Bagdad Copper Corp. pit in higher production and lower costs. In many instances, the Budas are going more than 6000 hrs. before overhaul—

another factor in lowered costs.





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"LITHOLINE" Protects Better"

When it comes to grease, Mr. Bloomer says:

"LITHOLINE protects better under the most difficult operating conditions — bearing failure has been reduced to a minimum. And this one grease eliminates the inventory problem of specialized greases.

"Needless to say, we're highly pleased with the reduced maintenance costs and longer life of our equipment — through the use of LITHOLINE."

FOR YOUR TOUGH JOBS . .

LENGTHENS ENGINE LIFE"

says JOHN F. BLOOMER CONSTRUCTION CO., Appleton, Wisc.

"Maintenance Costs Way Down"

The John F. Bloomer Construction Co. recently tackled a job that required the removal of one million yards of dirt. No tougher test could be devised to prove this statement by Mr. Bloomer:

"We've increased engine life considerably on our 26 pieces of heavy duty equipment since we switched to Sinclair SUPER TENOL. With this motor oil maintenance costs are way down. What's more, our equipment stays on the job longer with less time out for repairs."

Mr. Bloomer has this to say about Sinclair Diesel Fuel:

"Since changing to Sinclair Diesel Fuel, we've eliminated smoking conditions — and have noticed a marked reduction in carbon deposits on piston heads and valves. Our engines actually deliver more power with Sinclair fuel."

Let Sinclair help with *your* lubrication problems. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N.Y.



SINCLAIR SUPER TENOL

September 1952 — CONSTRUCTION Methods and Equipment — Page 85

EARTHMOVING . . . Continued from page 82

D = Distance between A_t and A_t in feet

V = Volume in cubic yards

For example, if the area of the section at station 21 + 00 is 412 sq ft and the area of the section at station 22 + 00 is 236 sq ft, then $(A, \text{ or } 412 \text{ ft}) + (A_z \text{ or } 236 \text{ ft}) = 648 \text{ ft} = 324 \text{ sq ft}$, the average of

the two end sections. Then 324 sq ft x distance between station 21+00 and 22+00, or 100 ft, equals 32,400 cu ft—or 32,400=

1,200 cu yd of earth. (See Figs. 9 and 10).

6. When a portion of the cross-section is partly cut and partly fill, computations for excavation and embankment are made separately.

The accuracy of this method depends entirely on the distance taken between elevations at any given cross-sections along the traverse line. The steeper the grade, the more frequently should cross sections be taken.

Borrow areas for fills are measured in the same manner, except that the levels are re-run upon the completion of work, and the resulting differences between these

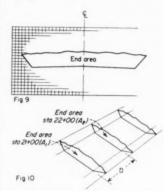
and initial elevations are used in the computations.

Borrow areas are used when fill for fill areas are not available from cuts or where it is unprofitable to haul cut material to the fill area.

The Mass Diagram

More appropriately, the mass diagram might be called a volume distribution graph. Its purpose is to help balance cut-and-fill dirt and to determine the profitable haul distances on any job for which a profile drawing is available. The alternative is to work directly from the cross-section notes, a questionable and difficult practice.

The basis for the graph is a curve on which the volume of dirt in yards becomes the ordinate (distance above or below base line) and linear distance between stations, the abscissa (the horizontal distance from the vertical coordinate).



Therefore, in plotting yardage distribution, the abscissa is a known figure as it is plotted against the stations along the profile. The ordinate can be determined by algebraic tabulation of the quantities of excavation and embankment in the following fashion.

First, all volumes are determined by end area method. Then cut volumes are adjusted to fill volumes for swell or shrinkage. Practically all materials when placed in embankment decrease in volume, and when excavated, increase in volume. If the final volume is less, the term "shrinkage" is used which is due to:

1. A loss in earth during transportation

2. Loss of material being washed away by rains during the construction and settlement periods

(Continued on page 88)



From 15 to 17 inches steam space above low water level, insuring ample steam reserve for sudden excessive demand.

Used by many Road Contractors with their asphalt plant installations.

May be fired with coal, wood, gas or oil.

For easy portability, boiler can be skid mounted with built-in base for burner.

Manufactured strictly to ASME requirements in sizes 40 to 150 H.P. and pressures from 150 lbs. to 350 lbs.

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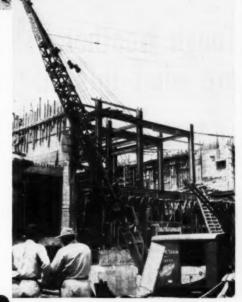
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MANITOWOC 2000 many jobs for many jobs for many jobs

Here's a $1\frac{1}{4}$ yard excavator that's the equal of many machines a size larger, in capacity, in power, stability and performance.

- Maximum safe lift is 25 ½ tons at 12' radius.
- Speed means more work capacity. Compare hoist speeds as high as 227"/min., swing 4.35 R.P.M., and travel 1.1 M.P.H.
- More power at the dipper. Only 13 gears; only working gears turn—greater efficiency, less trouble and more effective horsepower.
- Easily moved on trailers or flat car.

It's the best buy, by far in the $1 \frac{1}{4}$ yard class. That's why more and more contractors are switching over to fleets of these husky 2000's every day. Manitowoc Engineering Corp., Manitowoc, Wis.



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YD. GILL CRANES

One of the 4 Manitowoc 2000's owned by John McShain, Inc., Wash., D.C., excavating for Georgetown University Athletic Field.

Another Model 2000 placing concrete at Naval Health Institute, Bethesda, Maryland.

	Grade	Interval	Excava-	Shrinkage or Swell	Embank.	Algebraic Sum, Cut	
Station	\$ Elev.	Cut or Fill	Cut	Factor	(F111)	and Fill	Ordinat
10-00	98.00	C 1.0	216	193		• 193	
						1	+ 193
-50					216	- 216	
							- 23
11:00	101.00	F 3.5			1126	-1126	
							-1152
12-00	104.5	F11.0			2050	-2050	
13+00	108.0	F13.0			1760	1000	-3202
13+00		113.0			1/60	-1760	-4962
14+00	112.2	F 9.2			730	- 730	-4702
							-5692
15:00	114.0	F .4	i I		11	- 11	
							-5703
16+00	117.0	C 8.0	760	678		+ 676	
							-5025
17+00	120.0	C12.0	2320	2065		+2065	
						and the same of th	~2960
+75	124.0	C16.0	3400	3026		+3020	
-			-				+60

- 3. The subsidence, compression, displacement of the foundation due to weight of embankment
- 4. Uncompensated errors in field work and computations. When the volume is greater, the term used is "swell." The amount of increase for gravels and sand is from 5-12%, clays and loams 10-30% and for rock 30-100%.

In the following example a shrinkage factor of 11% has been used. From these volumes, a table of mass ordinates is prepared. The algebraic sum of cut and fill is computed between each adjoining station, and the ordinate becomes a running algebraic total from the point of beginning to any given station as in Fig. 11.

Plotting the ordinates at each station against the known station distances and the profile, results in the mass diagram shown in Fig. 12 (page 90).

On a descending curve below the base line, by determining the ordinate and abscissa at any point on the curve, the cumulative dirt shortage can be determined. Con-

(Continued on page 90)

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You can make sure that ignition troubles won't stop your engines no matter how tough the weather, or how hard you drive them, when you have a Wico Model XHD Magneto on the job.

Built to take every kind of field condition—sand, dust, dampness, vibration . . . the XHD is heavy duty in every detail.

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- Oversized coil protected by solid molded plastic.
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The XHD is available for four or six cylinder engines, with either flange or base mounting.

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GENERALS do any job, anywhere - FASTER! EASIER!



GENERAL L. C. M.

For most work off the road, some on. Broad, deep lugs and thick, rugged shoulders prevent cuts, snags, bruises. More rayon cords, more rubber for extra carcass strength.

GENERAL H. C. T.

Designed for most work on the road, some off. Long-wearing safety tread and reinforced shoulder cleats give more traction, more original and recap miles.

GENERAL DUAL TRACTION LUG

To move more yards of dirt, the General Dual Traction Lug digs deep for more traction in soft going, forward or backward. Makes heavy jobs easy.

Make Every Worn Tire Work Longer for More Profit! Your General Tire Dealer will KRAFT SYSTEM RECAP Worn Tires with the New General Truck Tire Tread of Your Choice



You're throwing away money when you throw away worn tires or accept an ordinary "adjustment" for them. Let your General Tire Dealer-a tire expertrestore worn tires with famous factory controlled Kraft System Recapping. You choose from the complete line of on and off-theroad new General Tire treads and he'll put that tread on your worn tire. He can do sectional repairs too. Get Kraft System Recapping -get more profit from every tire.

SPECIFY GENERAL TIRES NEW EQUIPMENT ON YOUR

Stay out of legal tangles

with this new guide to CONTRACT RIGHTS

An engineer-lawyer reviews 83 special problems

Here is another handy guide to legal problems that contractors, architects, and engineces often face. It gives the same sort of concise review of typical problems arising out of construction contracts that made Mr. Werbin's previous book on this subject so popular.

LEGAL GUIDE FOR CONTRACTORS, ARCHITECTS, and ENGINEERS

and ENGINEERS

By I. Vernon Werbin

Member of the New York Bar

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Just Out!

374 pp., \$4.75

This clearly written book describes 83 situations in the breaching and changing of contracts, and so on—situations of the sort that frequently lead to litigation, and tells how the courts viewed each case,

It is not intended to take the place of necessary legal services, but will serve to forewarn you of common pitfalls in your field help you to take precautions to avoid costly lawsuits.

The book is written to be easily understood by laymen as well as attorneys. It gives the facts and contract provisions involved in each situation, and cites cases to sustain the principles of law set forth.

Samples of the 83 problems covered:

- Contracts for furnishing labor and materials where the contract is silent as to the amount to be paid therefor
- Uncompleted work of deceased architect
- A contract provision that is repugnant to a right created therein is void
- Interpretation of subcontracts

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EARTHMOVING . . . Continued from page 88

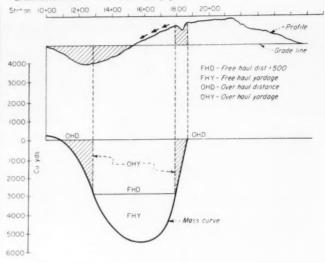


Fig 12

versely, with an ascending curve above the base line, the cumulative total is shown as excess dirt at that particular point.

For example, using the graph shown, at station 15 + 00, the dirt deficiency is approximately 5,700 cu yd. At station 17 + 00, the curve is ascending which indicates the deficit is decreasing. At a point recognized as station 18 + 60, the fill equals the excavation.

Then, by drawing in the freehaul distances and limit of profitable haul to scale, and by projecting the intersection of these lines with the mass curve on the profile, a visual diagram describing the most economical distribution of material is shown. Free haul 'generally is fixed by contract and varies from 500 ft to 1,000 ft, depending upon the section of the country.

The limit of profitable haul is that distance at which the additional cost of hauling equals the price of the dirt. If dirt costs 32c in the 500-ft free-haul area, and overhaul is charged at one cent per 100 ft (or station), then the limit of profitable haul equals 100 x 32 + 500 or approximately

3,700 ft. Such a formula can show that it may be more economical to waste cut dirt at a certain point and use borrow material, even though an excess of cut material is available.

The Public Gets Into the (Fatal) Act

SIDEWALK SUPERINTENDENTS manage occasionally to become involved in dangerous escapades on construction projects, in spite of eternal vigilance by contractors. One such, a man of 63, recently climbed to the top of a 4-ft wooden fence and stepped on a parallel 20-in. water pipe inside to get a better view of an excavation. He lost his balance and fell headlong to his death in the 20-ft cut.

A jury found a highway contractor guilty on a charge of manslaughter growing out of the drowning of a 9-yr-old boy in a water-filled ditch excavated along a new turnpike. Prosecution contended that the contractor had failed to furnish adequate safeguards around the excavation.





maintenance easier, faster

It's no snap-running an efficient maintenance shop out in the field. When big rigs are "pulled off the line" you have to move fast -hours-even minutes cost plenty!

Vital equipment must be sent back to the job quickly . . . fully repaired . . . and thoroughly lubricated in order to fight the threat of more repairs and breakdowns.

And here-in the shop, as in the field-you'll again find Alemite "Friction Fighters" on the job. Ready with an efficient, compact, fully portable lubricator that puts the final touch of lubrication to a repair job . . . helps return equipment to the line with maximum protection, in minimum time.

Shown in operation above, is Alemite Model "711-A." A powerful, high-pressure lubricator with giant 8-inch rubber tired wheels that let you roll it anywhere. Outdoors, indoors, over rough floors, up and down steps. Attached to an air compressor, this "711-A" pumps direct from 25, 35 or 50 lb. pails. Brings all the advantages of modern Service Station Lubrication right to your shop. See it. See all of the Alemite "Friction Fighters" shown here. They'll help you cut "downtime," too. Increase the output of both your men and machines!

Special Alemite Value lever-type hand gun

- Handles 21 full ounces of any type grease!
- Develops up to 6,000 lbs. pressure!
 - · Reaches fittings easily with hose and giant button head coupler!

Easy to fill and operate, this heavy duty lever-type gun is built for rugged wear and trouble free service. Specifically designed for the construction indus-try. Has loader fitting for easy refilling without disassembly. Ask for Alemite Model 6679-J. Hose Model 6829-A.

Real Work Saver Alemite loader pump

- Packs guns solid with grease.
- · Eliminates troublesome air pockets.

Designed for use with 100 lb. drums. Keeps lubricants "refinery clean" from barrel-to-bearing. Ends all risk of dirt or contamination. Actually res up to 3% man-hours for ever 100 lbs. of lubricant use Ask for Alemite Model 7198-L.





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Select Your Own portable service station

- You can custom build the rig you need.
- Get complete lubrication service—in the field.
- · Apply oil or grease direct from barrel-to-bearing.

New s-e-c-t-i-o-n-a-l-i-z-e-d platform units allow just the pumps, reels and hand meters you require - assembled into one, portable rig for faster, easier lubrication right on the job!

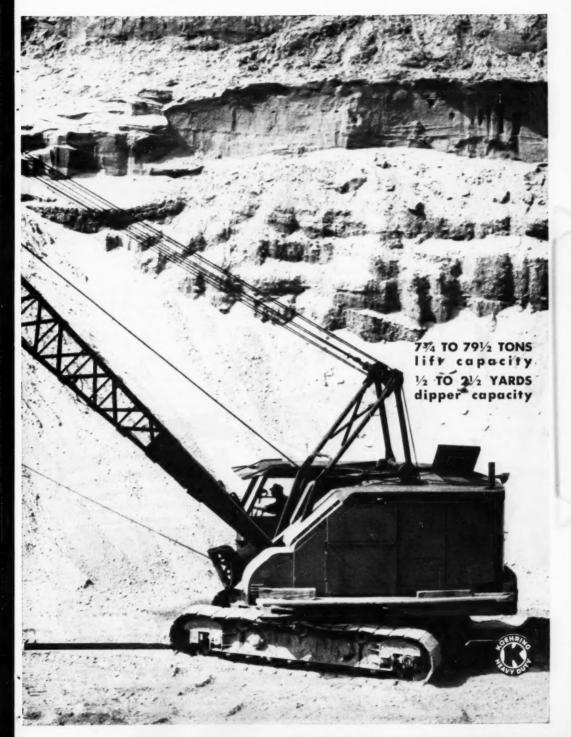


You owe it to yourself to check "KOEHRING WORK CAPACITY"

While mechanical features, operating advantages, speeds and capacities are important to excavator and crane efficiency... final proof of profit earning value is in cost per yard moved or ton lifted. That's why you owe it to yourself to get all facts on "KOEHRING WORK CAPACITY". For specific figures, see your Koehring distributor.

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September 1952 — CONSTRUCTION Methods and Equipment — Page 93

There's no six-wheeler like it-in the 28,000 GVW class!

Here's the answer to the tough, closely scheduled jobs you're bidding on today: It's GMC's great new Model 450-30 six-wheeler chassis rated at 28,000 GVW for use with dump, concrete mixer or general purpose body.

GREAT because its new "302" engine is pound-for-pound the mightiest in truck history! Here's 145 H.P. to pull capacity loads through mud, sand and slick—with faster pickup and less gearshifting than any other medium sixwheeler you've ever put on a job!

GREAT because its record-breaking 7.2 to 1 compression ratio turns out highest ton-mileage performance—and does it on ~ gular gasoline!

GREAT because an extra differential acts between its dual-drive rear axles to put power where it's needed—to compensate for road irregularities. This eliminates power waste and tire spin. Inter-axle lockout optional.*

GREAT—you bet! But drop by your GMC dealer—get its price—and you'll get the greatest surprise of all. It costs far less than you'd expect!

GMC Truck & Coach Division of General Motors



*Every GMC 450-30 has provision for an optional, inter-axle lockout that lets you pour full, unrestricted traction to both driving axles when extreme conditions demand it. Operated from the dash.

GASOLINE 4,800 GVW TO 90,000 GCW DIESEL 19,500 GVW TO 100,000 GCW GENERAL MOTORS



OLIVER'S BID for recognition in the big tractor field is this new OC-18 featuring ease of operation through air-controlled differential steering and air brakes. Chief engineer H. W. Brock, who headed up the design staff, proudly presents his new trim-looking baby to the construction world.

Oliver Steps Into Big Time With OC-18 Tractor

Another Equipment Development Report

By HAROLD W. RICHARDSON, Editor

SHE'S AN OPERATOR'S DREAM come true-the brand new OC-18 heavy duty crawler tractor that is Oliver Corporation's bid for recognition in the big time construction, logging and industrial fields. At the same time she fulfills the promise made by Alva Phelps, Oliver's Board Chairman, to the company's distributors at the '48 Road Show. Phelps said then, and now proves, that Oliver is in the construction and industrial equipment game for keeps, and that the big money needed for tooling and development in this field was earmarked for the purpose.

This new crawler steers with a flick of the wrist, just like a well-trained cow pony. An innovation is a clutch bar, a looping heavy pipe that follows the contour of the rear engine housing. Pull it toward you and you engage the clutch; push or kick it forward and the clutch releases—no pawing in the air for a fixed clutch lever.

Except for stomping on the parking brakes at chow time and end of shift, the operator needs no feet. He can tuck them up under him on the wide two-man foam rubber cushion, for all controls are by hand—even to air steering. Starting is all-electric—just push a button

Oliver Corp. bought Cleveland Tractor Co. eight years ago, and thus took over the old line of Cletrac crawler tractors. The company's last big tractor development was the Cletrac FDE, brought out in 1945. Somehow, this machine never caught on in construction, though it did have considerable success in logging because of exceptionally high clearance. One big trouble with the FDE was objection by the operators, who claimed it took all too much brute strength and awkwardness to run the machine.

Therefore, when Chief Engineer (Continued on page 98)

This precision transit gives years of precision work



Model No. 7014 with "A" standard, "U" type also available. \$575.00* complete

... yet costs less than any other quality engineers' transit

You can pay more, but you can't buy a finer instrument than the White Engineers' Transit. Typical of the added manufacturing refinements that assure you of more years of super-precision are White's graduations:

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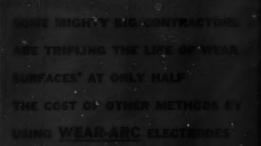
In addition, White's unexcelled coated optics provide a clear, sharp image — without halation even under adverse conditions at long distances. Consider, too, the totally enclosed leveling screws, waterproof compass box, hand-fitted, anti-friction, virgin hard bell metal centers.

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AR-5

No Elbow Room.

BUT ROOM FOR GRADALL'S FAMOUS ARM-ACTION

RADALL CONTRACTORS are often called on for many unusual jobs. T And a Cleveland contractor, James Murphy & Sons, recently took on this tricky railroad job that required working in an area not much wider than the truck itself. On one side was a cut that had to be trimmed. On the other, a busy main line track where traffic had to be maintained.

But the Gradall's unique arm-action and controlled down pressure did the iob fast-and better than the hand labor and machines it replaced. Working from the top of the bank-around posts and other obstaclesit first trimmed the top part of the slope. Then, backed into the narrow passageway, its hydraulic-telescoping boom "reached out" to finish the slope's lower portion, as well as digging a drainage ditch and cleaning the roadbed right up to the ties-all from this cramped position-with no hand labor.

The multi-purpose Gradall is one machine you're sure to keep busy on all sorts of earth-moving and construction jobs. For a field demonstration of its cost-cutting efficiency, see your nearest Gradall Distributor.



Gradall's 360° mount and telescoping bo mitted loading spoil over cab into waiting truck necessitated here by one-way approach to work area.



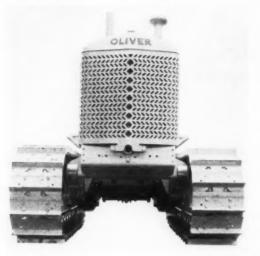
Hydraulic arm sction boom tilts bucket to work



Gradall Distributors in over 75 principal cities in the United States and Canada



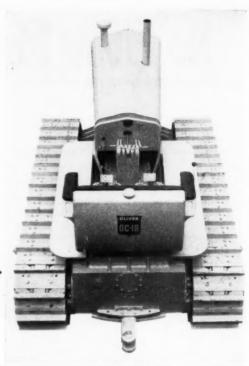
GRADALL-THE Wulti-Purpose EARTH-MOVING AND CONSTRUCTION MACHINE



Coming . . .

... or Going

the OC-18 is a trim craft. Front view (above) shows the heavy springs, high underclearance, heavy crankcase guard and rock guards for drive sprocket wheels. Rear view (right) shows arrangement of controls (bulldozer control not yet mounted on this model), and SAE standard rear case for mounting rear-end attachments. Engine hood is tapered to rear for increased visibility of bulldozer.





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This FERGUSON sand-ballast rubber-tire roller weighs 100,000 ± ballasted; 19,000 ± empty. 1250 ± bearing pressure per inch of width, fully ballasted, with 18.00x24" 24-ply tires. Other size tires also available. Tongue detachable and interchangeable with arched-type tongue for use with rubber-tired tractors. Engineered and constructed for years of rugged service.

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SHEEPSFOOT & TAMPING
ROLLERS OF ALL SIZES
RUBBER-TIRED COMPACTORS UP TO 200 TONS
MAINTENANCE ROLLERS
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SUB - GRADE PLANERS
TRAILERS - BATCHERS

SHOVEL SUPPLY COMPANY, Mirs.

Office & Plant

Dallas, Texas

Mail Addr. P.O. BOX 1369 Cable Addr. SHOCO DALLAS H. W. Brock and his staff set out more than three years ago to design a brand new heavy-duty tractor, operator comfort and ease of operation were of utmost concern. Accessibility and easy maintenance and service also were considered important factors. New and mighty expensive tooling at the Cleveland plant assures precision manufacture, and 2½ yr of field tests show that the new tractor can take it. The FDE has now been taken out of production, entirely supplanted by the OC-18.

While the new tractor fits into the pattern of the three big competitive models, Oliver made no attempt to surpass any of them in size or power. The OC-18, rated at 126 drawbar hp and weighing 32,000 lb, was designed, says Vice-President Bill Miles, to meet most requirements for construction, general bulldozing, pushloading and all-around tractor and scraper work.

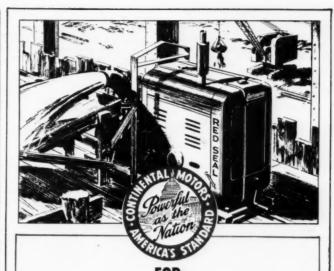
It is powered by a Hercules DFXE 6-cyl diesel, fitted with Bosch fuel injectors. This engine is rated at 225 max hp at 2,400 rpm, and at 179 hp at 1,500 rpm, the speed set for the OC-18 tractor operation. Belt hp is given as 149. Torque peak of the engine is at 900 rpm, which allows ample reduction in engine speed for lugging.

Utilities in One Package

A neat maintenance and service feature is an enclosed utility compartment at the rear of the engine hood that houses two 12-v batteries, voltage regulator, air governor, air receiver, cluster instrument panel, switches, fuel shutoff, fuse block and starter button. This compartment easily can be reached through the top cover, or the whole assembly can be lifted out intact by disconnecting the services and removing six bolts.

The engine, transmission and final drive can be removed independently with a minimum of trouble. The rear steel case, carrying the drawbar, is arranged to meet the new SAE standards for rearend attachments and height of drawbar. Brock was a member of the SAE committee that established these standards. Brake and steering clutch bands can be adjusted through tap holes at rear of case, or through the top if a PCU or winch has been fastened to the case.

Driving through a 14-in. doubleplate clutch, the transmission pro-(Continued on page 101)



LONGER SERVICE LESS TIME OUT LOWEST OVERALL COST ALWAYS CHOOSE EQUIPMENT WITH CONTINENTAL RED SEAL POWER

LOOK FOR THE FAMOUS RED SEAL TRADEMARK ON THE ENGINE OF:

Pumps . . . Compressors . . . Shovels . . . Cranes . . . Mixers . . . Rollers . . . Ditchers . . . Conveyors . . . Hoists . . . Winches Welders . . . Highway and Industrial Trucks and Tractors Generators Earthmovers . . . and other Specialized Machines

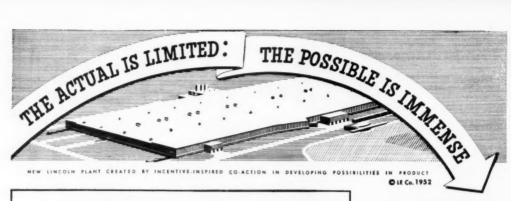
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Six series of air-ceoled fourcycle engines—vertical and horizontal shaft—from 1 to 2½ h.p., for use in lawnmowers, sprayers, garden tractors, compressors, pump



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Continental Motors Corporation
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WELDED RIGID FRAME DESIGN SAVES 20% STEEL





Hagerman Construc-tion Company; Erec-tors: Martin Erecting Company and The Machinery Company. ndiana. Fabricators: be Fort Wayne Struceneral Contractor; ig. 3-Allen County Memorial Coli-

with its 224' clear span is one of the largest rigid-frame structures in the country. By eliminating interior columns, that would have been necessary had a system of trusses been used, the rigid frame design has \$3,000,000 Allen County Memorial Colicut steel requirements by 20%. From past experience with this type of construction, an overall saving of 8% The 1200 ton structure consists of 10 rigid frames, UTS COST 8% By A. M. Strauss, Architect Fort Wayne, Indiana anticipated over riveted design.

new

seum

weighing approximately 67 tons. These frames are Total structural weight is 1246 tons, costing \$230,000. which averfield splices were made with the frame in a vertical Best erection time was two frames per week for the

ground

shop-fabricated in five unit sections of columns, rafters and crown sections. After delivery to the site, the three center sections are spliced on the ground before erecting. unit erection cost per frame is \$3400, using track-mounted erection towers welding of the center sections. iges \$50 per ton. position. AII

Latest data on calculations, procedures and costs are found in the new 9th Edition Procedure Handbook of Arc Welding Design and Practice. Price only \$2.00 postpaid in U.S.A.; \$2.50 elsewhere. ARC WELDED STRUCTURES HOW TO DESIGN

WELDED DESIGN **ALWAYS SAVES STEEL** AND LOWERS COST



Fig. 1—Cuts Fabricating Couts—Plate sec-tions for columns and rafters are flame cut, drawn up by sledging and wedging, then tack welded with Lincoln "Betewelds" selectrodes, using "Shield-Are" motor-driven are welders.



Fig. 2.— Speeds Welding — Webs and flanges are fillet welded with "Manual Lincolnweld" at speeds of 26 to 30 inches per minute. Average time to fillet weld one side of 71 foot rafter is

*Preferred standards for electrodes and welders on quality work.

HERE'S HOW

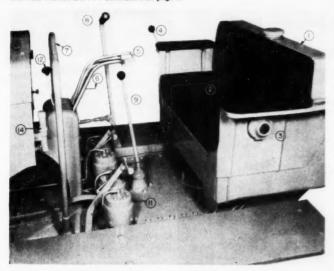
Studies in Structural Arc Welding free on request. Designers and engineers write on

LINCOLN ELECTRIC

CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

Page 100 — CONSTRUCTION Methods and Equipment — September 1952



EXCEPT FOR APPLYING parking brakes, operator need never use his feet. Here are the operating control details. (1) 56-gal fuel tank; (2) two-man foam rubber seat; (3) service recorder (not standard); (4) friction throttle lever; (5) steering control levers, press either one down slightly to turn in that direction; (6) air brake levers, one for each track; (7) clutch bar, a safety innovation that engages clutch when pulled toward operator, releases when pushed or kicked forward; (8) buildozer control; (9) gear shift; (10) foot parking brakes, one to each track; (11) pneumatic Rotochambers; (12) air brake lock lever; (13) removable utility compartment; (14) Chevron cold starting aid.

vides four speeds forward, from 1.50 to 5.45 mph, and two speeds reverse, 1.83 and 3.53 mph. A heavy reduction is taken in the final drive through a bull gear and planetary gear set to each sprocket, which reduces torque loads on the transmission and differential components.

Steering is by controlled differential drive, air-actuated, with power on both tracks through all degrees of turning. Minimum turning radius is 17 ft, but one track can be locked by air brakes for a pivot turn if desired. Steering control is by two levers within easy reach of the operator which curve together so both can be operated with one hand.

Outside of each steering lever is an air brake lever controlling each track independently. These controls are tied in through linkages with two manual foot parking brakes. The air brakes can be locked in holding position, if desired. Steering and air brake levers are interlocked to prevent turning with the brakes on.

Air for brakes and steering is supplied by a compressor on the right side of the engine and driven off the fan belt. On the opposite side are the generator and starting motor. Starting is all-electric, with the two 12-v batteries being hooked up in series to put 24 v into the starting motor. A Chevron cold-weather starting aid, mounted on the instrument panel board, is standard equipment.

The track and track frame are new design for Oliver, with a larger front wheel, giving full 100 in. of ground contact with 22-in. wide grousers. Track ground pressure, with bare tractor, is 7.12 psi, Track gage is standard 78 in. Track links, of 1046 steel, are differentially hardened. The track frame carries six lower rollers, one upper.

Ground clearance is unusually high, 17 in. below crankcase guard. A life-prolonging feature has been added to the sprocket wheels. An alternate set of sprocket teeth has been placed between sprockets engaged by the track links. When the first-used set of teeth shows signs of wear, the track links can be shifted to the alternate set, and you have the same as a new pair of sprocket wheels.

Detail specifications are shown in the accompanying table.

The bare tractor fits into the less than \$16,000 class, f.o.b. Cleveland, with these standard features: air steering, Chevron cold-weather starting aid, rear wheel rock

(Continued on next page)

WET JOBS

#9 of a Series

PLANT McMANUS, GEORGIA POWER CO.

Brunswick, Ga.

Contractor: Standard Construction Co.



WELLPOINT ENGINEERS LICK MARSH AREA PROBLEM

PICTURE A RIVER nearby . . . a subtropical site so marshy that the ground shook like jelly beneath the machines. To these obstacles, add a water table almost at surface and, farther down, some layers of muck 2 to 3 ft thick.

- Such was the problem pitched at Griffin engineers and here are the answers they returned, with a carefully planned 2-stage wellpoint system. (1) Foundations go in quickly, as deep as 22 ft below water level. (2) Over 22,000 cu yds of earth move out economically, by dragline. (3) Subgrade is so bone-dry that the 1800 timber piles are driven with pile rig working from bottom of excavation.
- When a job calls for "knowhow," call for Griffin, dewatering experts for nearly two decades.



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OLIVER TRACTOR . . . Continued

guards, extra-heavy crankcase guard, heat indicator and electric starting. Lights, air brakes, cab, and heavy-duty logging radiator guard are extra.

Reber C. Stupp, Cleveland plant manager, will be responsible for manufacture. While production has been started, more new machine tools and additional factory rearrangement will soon bring the output up to schedule. The Heil Co. will supply bulldozers for the new machine.

Claim for easy operation is no idle boast by Oliver. We personally put one of those bulldozer-equipped tractors through its paces at the Cleveland plant after only a moment's instruction to learn which lever was which. The way it would bulldoze out a deep cut while making a sharp turn was a sweet sight. And if a mere editor can handle this machine with ease. as we did, what could a real operator do? Plenty, we believe, and he would enjoy doing it — and wouldn't be dog tired at end of shift, either.

This clean-cut husky new OC-18 tractor shows a lot of promise.

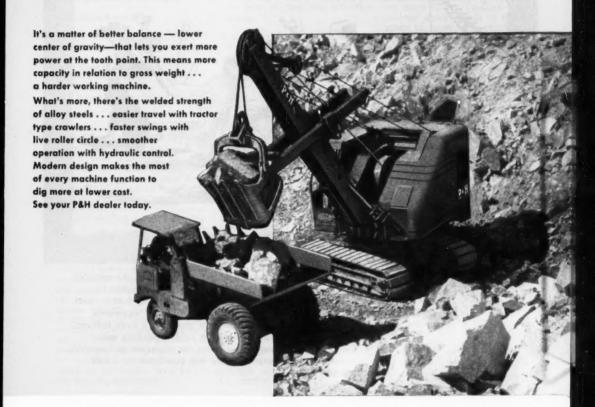
Principal Specifications Oliver OC-18 Tractor

ENGINE: Hercules DFXE 6-cyl diesel

Drawbar hp	
Belt hp	
Operating rpm	1,500
DRAWBAR PULL at max torque, Ib:	
1st gear	31,900
2nd gear	20,900
3rd gear	15,950
High gear	10,550
Reverse, low gear	30,050
Reverse, high gear	16,850
TRACTOR SPEED, MPH:	
Low	
2nd	
3rd	
High	
Reverse, low Reverse, high	
FUEL CAPACITY, gal	
CLUTCH, double plate, size, in.	14
TRACK:	
Length, ground contact, in.	100%
Width grousers, in.	27
Ground contact area, sq in.	4,411
Lower rollers, no.	
Upper rollers, no.	
Shoes per track, no.	35
DIMENSIONS:	
Length, in.	
Width, in.	
Height, at dash, in.	
Ground clearance, in.	
Track gage, c.c., in.	78
WEIGHT:	
Shipping, Ib.	31,360
Operating, lb.	32,000
Ground pressure, sq in.	
REAR POWER TAKEOFF, rpm	1,500

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Construction methods . . .

have been "jacked up" to amazing heights of speed and proficiency since the days of these 18th century stone masons. Their crude tools served to teach the value of developing better, more efficient equipment.



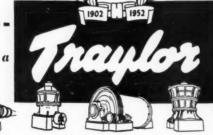
In recent years, construction men have developed the valuable technique of producing aggregate on the job. Traylor has applied 50 years of experience in the rock crushing field to meet this new crushing requirement. Today, Traylor equipment has earned a world-wide reputation for producing a more uniform, cubical aggregate that meets the most rigid engineering specifications. It takes experience to solve the aggregate problems of the construction industry. Traylor has experience . . . half a century of it.

The Traylor Ty Reduction Crusher combines rugged construction with simple design to give maximum efficiency and easy maintenance. Bulletin 6112 gives specifications and description.



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leads to greater profits





Construction Equipment Users Can Cash In on . . .

Torque Converter Advantages

By R. P. NICHOLS, R. G. LeTourneau, Inc.

What is a torque converter?

How does it work?

What are its advantages . . . its disadvantages?

How does it fit into the construction industry?

Can it make money for contractors?

BEFORE ANSWERING these questions, let us talk for a moment about fluid couplings. A fluid coupling is a clutch that transmits power by means of a liquid in motion, rather than by friction between two clutch surfaces.

You have seen the principle of a fluid coupling in action-when you stir a glass of tea! As the spoon goes around and around at the top of the glass, the sugar at the bottom begins to move, and soon it is moving at the same speed as the liquid. Replace the spoon and sugar with paddles, connect the lower one (the sugar) to a power take-off shaft, and there, in the roughest sense, is a fluid coupling. A fluid coupling, like a friction clutch, cannot increase engine torque-it can merely take the torque, or turning force, produced by the engine, and transmit it to the drive train.

Here, then, are the advantages of a fluid coupling over a friction clutch:

- 1. Power is transmitted through oil and therefore is completely cushioned; no shock or vibration can be transmitted from the engine to the power train, or vice versa.
- 2. Power is applied smoothly and continuously under all operating conditions.
- 3. Breakage, wear and maintenance in the power train are reduced drastically.
- 4. At engine cranking speeds, there is little or no drag in the fluid coupling, and the engine can be started easily without disengaging a clutch.

These advantages of a fluid coupling over a friction clutch drive in themselves would be more than enough to justify the use of the fluid coupling in construction machinery. But the torque converter provides additional advantages, as we shall see,

Torque Converter Principles

The conventional gear-shift type transmission in an automobile is a torque converter. When you put a car in first or second gear to climb

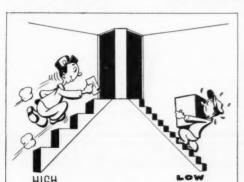
or accelerate, you are merely gaining more torque (pulling effort) on your drive wheels at the expense of speed. For example, if you can go twice as fast in second gear as you can in first, your pulling effort in second gear is half of that in first gear. The horsepower of the engine (torque times speed) stays the same, but you can increase the pulling effort and reduce the car speed by shifting gears (Fig. 1). The car transmission is a torque converter that multiplies engine torque through gears at predetermined and fixed ratios.

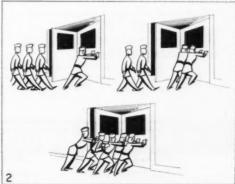
The hydraulic torque converter does exactly the same job—but it does it through oil instead of gears; it does it automatically; and it does it with an infinite number of ratios. It's just as though your car transmission had 1,000 or more gear selections instead of just three, and the correct one to meet most efficiently, the acceleration, grade and ground conditions was selected for you automatically.

How Does a Torque Converter Multiply Torque?

Assume we have a revolving door through which is marching a line of troops at a uniform rate (Fig. 2). Each man gives the door a push as he goes through, which is just enough to keep the door revolving steadily. Now put a load

(Continued on page 107)







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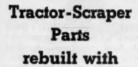
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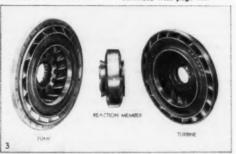
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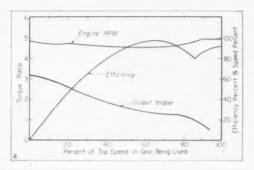
292

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TORQUE CONVERTER . . . Continued from page 105





or a drag on the door so that it slows down. The men will begin to pile up until, when the door is going half speed, two men will be pushing at the same time, and the push (or torque) on the door will be doubled. As the door slows down still more under the drag, more men will be caught in the door and increase the push until, when the door is stopped, the push (or torque) will be at its maximum.

Consider the force of one man as equal to the torque of the engine, the marching of the men as the flow of the oil under pressure, the revolving door as the torque converter and you have, in the simplest sense, the principle of the torque converter. Just as the revolving under the constant push of the troops will tend to speed up as the drag is reduced, so a machine equipped with a torque converter will speed up as the drawbar pull required is reduced.

When the machine is stalled and maximum possible pull is required, the torque converter provides it. As the grade levels off, or the scraper blade is pulled out of the ground, torque or the pulling requirements are reduced and the torque converter automatically speeds up the machine. Torque and speeds always will be perfectly balanced so as to use the maximum engine horsepower available, and the load will always move at the fastest speed possible under the given operating conditions.

What Constitutes a Torque Converter?

A torque converter has three main parts (Fig. 3):

1. An impeller is connected to the engine and acts as a pump to put the oil under pressure—like the

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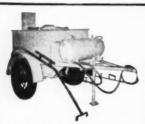
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TORQUE CONVERTER . . . Continued

line of marching troops, it provides the "push".

- 2. A turbine is connected to the final drive and is turned or pushed by the oil under pressure, just as the revolving door is turned or pushed by the troops.
- 3. A reaction (stationary) member diverts the oil back to the pump so that it may be used over and over again—just as the troops could be routed through a corridor to return to the revolving door to give it another push. The oil gets warm in doing this work and is cooled by a radiator before going back to the pump.

The principal difference between a torque converter and a fluid coupling is that the fluid coupling has straight vanes, whereas the torque converter has curved blades. The curve in the blades enables the torque converter to multiply the torque, by changing the direction of the oil flow and absorbing its energy.

Performance—An excellent way
to see just what the torque converter will do in the way of performance is to show a chart which
indicates the effect upon engine
speed, torque converter efficiency,
and the torque converter output
torque as a load is put on the unit
which causes it to slow down, such
as dropping a scraper blade in the
ground or starting up a steep
grade.

This chart (Fig. 4, page 107) indicates that engine speed stays up throughout the entire speed range, even when the unit is stalled, certainly the most extreme condition.

Many pieces of construction equipment have engine-driven attachments, such as hydraulic pumps, and generators, that operate most efficiently when the speed of the engine is kept up to its maximum. The use of a torque converter in such cases insures that the engine is always at best speed, which means that the unit and its attachments are always working under the most favorable conditions.

Within limits, the output torque—the force that actually moves the load—increases at about the same rate as the deceleration of a unit dropping down. There is more or less constant amount of horse-power going into the drive wheels on the machine whether the unit is traveling at 30, 29, 28, 25, 22, 16 mph, etc. Obviously, this is impossible with a conventional gear-

type transmission which has only four or five fixed speeds.

At those fixed speeds, the full power of the engine is being used but, between those speeds, either the engine is running light or it is being lugged down, which means that some horsepower is being sacrificed.

• Braking on grades—The hydraulic torque converter is not free-wheeling. When descending steep grades where the load pushes the machine, the torque converter still transmits torque to a high degree and permits the compression of the engine—used in conjunction with other braking devices such as a Hydratarder or Electrotarder—to be used in keeping the machine slowed down to a safe speed.

The operator has only to select the proper gear for safety, depending upon load, grade and ground conditions, and the braking effect of the engine and retarder will be in effect just as if a conventional transmission were being used.

Multiple Stage Converters

The torque converter which has been described is a single-stage unit, consisting of one impeller, one turbine, and one reaction member. The oil has just one chance to push on the turbine before it returns to the pump. A two-stage converter has another turbine, so the oil has two chances to push. Picture again the revolving door, and imagine the troops



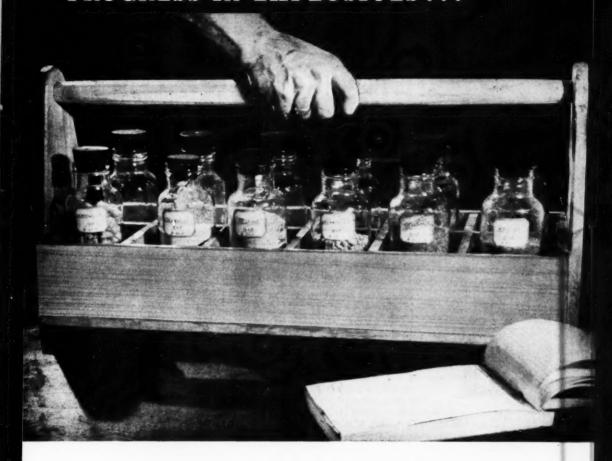
can be in two compartments at the same time (Fig. 5). A threestage converter has still another turbine and another reaction member, and the oil can push three times before returning to the pump.

• Advantages and Disadvantages

—The single-stage torque converter is the simplest, cheapest

(Continued on page 110)

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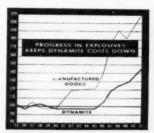
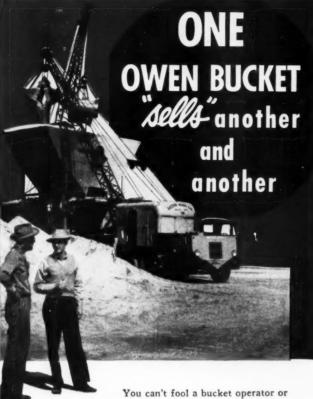


Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods.1935-39values=100.

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TORQUE CONVERTER

. . . Cont. from p. 108

and most trouble-free type known. Although it will not multiply the engine torque as many times as the multiple stage types, this is overcome easily by the use of a multi-speed transmission behind the torque converter, which makes it unnecessary to multiply the torque more than two or three times the rated engine torque, just enough to bridge the gap between the gear-speeds.

It must be remembered that a torque converter is at peak efficiency only when the speed of the output shaft is 50% or more of the input shaft (Fig. 4), and it is most advantageous to keep the torque converter working in this range. This can be done by the use of a gear-type transmission where the gear speed is selected to conform reasonably to operating conditions.

If you were hauling a heavy load up a steep grade, you would expect to put your unit into low or second gear, and this would keep the torque converter working at its most efficient ranges. You could, if you wished, negotiate the same grade with the transmission in high gear, and the torque converter would provide the necessary pull to do the job, but it would do so at a decided reduction in efficiency and speed, so it makes good sense to fit the gear to the job, rather than ask the torque converter to make up for a lazy operator.

What Multiplication Means

A two-stage torque converter will multiply engine torque from four to five times and a three-stage torque converter will multiply it up to six times. Here again is must be remembered that these high torque multiplication ratios come only when the torque converter is slipping a great deal, and the output shaft is traveling at a very low speed, as compared to the engine.

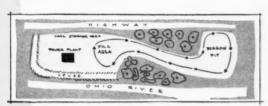
This high torque multiplication feature of the three-stage torque converter has been used in heavy construction equipment, and it will enable a tractor to work on all job conditions ranging from the loading of a scraper to the other extreme of running on the level empty—all with one gear speed. But the result was that at slow speeds the torque converter was quite inefficient, and economy, maintenance and engine life suffered.

To compensate for their ability (Continued on page 112)



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Whether your job calls for one unit or a dozen, it will pay you to check all the profit-making features of TS 300 Motor Scrapers. See your LaPlant-Choate distributor today.

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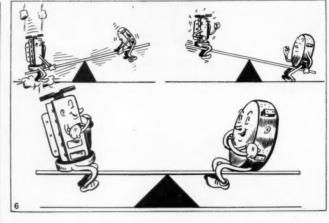






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to multiply torque many times, multiple-stage torque converters depend upon extremely close-fitting and efficient seals under pressure in order to keep operating, something which is not true with the single-stage converter.

• Engine and Torque Converter Balance—For maximum performance and efficiency, torque converter size and characteristics must be matched carefully to the engine, taking into consideration engine speed and power (Fig. 6). If the torque converter is too large, the engine will never come up to speed, never develop its full power. If the torque converter is too small, the engine will always be running "light" and, again never develop its full power.

Why the Industry Is Adopting the Torque Converter

With all its virtues, a torque converter is not a "cure-all". In some applications, the use of the hydraulic torque converter has not been completely successful, and this has caused this mechanism to acquire a bad name in certain circles. Primarily, the situation was caused by a mis-application of the torque converter, in which the unit was used with a single- or two-speed transmission which made it necessary that the torque converter operate in conditions from very low speeds where a high drawbar pull was required up to high speeds where a small amount of drawbar pull was necessary. (Fig. 5).

In such applications, all too often the torque converter was working at a very high slip and, consequently a very low efficiency, all of which caused slow travel time, overheating of the torque converter and poor performance.

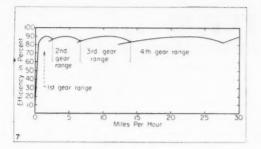
To realize the full potentialities of the torque converter, it must be kept working at high efficiencies; it must be so applied that the slip between the engine and the drive shaft is at a comparatively low figure. This can be done only by incorporating a multiple-speed transmission with the converter. It is especially desirable that this transmission have a wide working speed range, and also that it enable the operator to change gears instantaneously without loss of momentum of the machine.

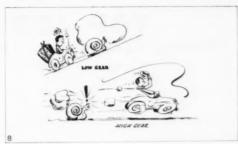
When the speed of a heavy piece of construction machinery is changed instantaneously, it puts a shock on every part of the drive mechanism, and the use of a fluid coupling or torque converter is desirable to eliminate this shock.

In the final analysis, the torque converter is highly desirable to give an infinite number of gear ratios and to eliminate shock in the drive train, but it needs an instantshift transmission with a number of working speeds to give the highest level of performance. The instant-shift, multiple-speed transmission requires a torque converter to bridge the gap between gear speeds and to eliminate shock, so the adaptation of the torque converter with this type of transmission is a perfect marriage, each complementing the other to produce a highly efficient, long life low maintenance and money-making machine.

The chart in (Fig. 7) illustrates a practical working machine which incorporates a torque converter and a 4-speed transmission in a







unit with a top speed of 30 mph.

Although the torque converter can work over the entire speed range and move the machine at any speed from 0 to 30 mph, for best results it should be incorporated with a gear-type transmission which will always insure that the torque converter is operated in its most efficient range.

As indicated on the chart, with the proper selection of the gear speeds, the efficiency of the torque converter can be kept at or near its maximum at any speed from 1 mph up to 30 mph. The operator, in order to get the most out of the machine, must use good judgment here, just as he would in a machine not equipped with a torque converter (Fig. 8).

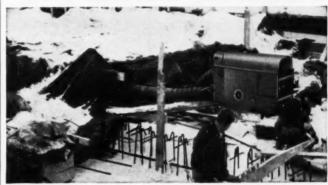
A good operator doesn't attempt to climb a steep grade with a loaded machine in high gear, nor would he keep the machine in first gear running on the level without a load.

• Field Observations—An analysis of field operations of units equipped with torque converters indicates that fuel consumption is about the same as with units not thus equipped. Actual service records indicate that maintenance costs on units equipped with torque converters have been reduced materially on all parts of the machines. In addition, operators favor torque converter-equipped units because they can do a better job easier.

• Comparison of Performance— Assume two machines are identical except that one is equipped with a torque converter. The gear speeds are such that the unit will travel at 3 mph in first, 7 mph in second, 15 mph in third, 30 mph in fourth.

On a given grade and with a given load, the unit has enough horsepower to travel 11 mph. Be(Continued on page 116)

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TORQUE CONVERTER

. . . Continued from p. 113

cause of the infinite speed ratios possible with the torque converter model, that unit can be put in third gear and have enough torque to go up the grade at 11 mph. The other unit, if put in third gear, will lug down until it has enough pull or torque to negotiate the grade, but this may be at 8 or 9 mph. For good operation, the unit would undoubtedly be put in second gear and go up the grade at 7 mph with the engine running light. This means that the torque converter-equipped unit is going up the grade better than 50% faster than the unit without the converter. Over a period of time, this means more trips, more material carried and more income for the contractor.

Obviously, figures given do not cover every job possibility, but they do illustrate that the torque converter allows every bit of engine power to go into speed and production, rather than limit the output by a fixed-speed transmission, where, all too often, one gear is too high for the conditions, and the next one too low.

Apparently the application of the torque converter to the industrial and heavy construction field has only begun to scratch the surface. You will be hearing more of it in the construction field.

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- 4 Types of 2-speed Crawlers
- Drop-forged Treads
- Independent House Lock
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You will get important savings on every shoring job when you use the new oneman, all-steel Safway Shore: YOU SAVE TIME—because Safway Shores are erected so easily. Just extend upper tube to approximate adjustment fasten with pin—rotate sleeve nut to exact adjustment.

YOU SAVE LABOR — because one man can carry, locate and adjust Safway Sbores. Handle is at chest level. No nailing or bracing in most cases. Shores will stand alone.

YOU SAVE MONEY—because fewer Safuray Shores are needed to support the same loads (capacities to 9,900 lbs.). Less maintenance required—sleeve protects threads.

SAFWAY SHORE ADVANTAGES

- Only 3 Sizes—Cover a 6-15 1/2-ft. range. Each size adjustable through 5 ft.
- 3 Head Types 8 in. U-head seats 4 in. or lapped 2 in. lumber. 14 in. U-head for beam formwork square flat plates for reshoring.
- High-Carbon Steel Tabing—No wood members of uncertain condition and load capacity—no splintering or fire hazard.
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 Bracing Brackets—For heights over 12 ft.

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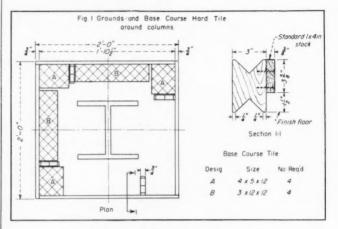




MILWAUKEE 13, WISCONSIN
Tubular Steel Scaffelding and Equipment

Better Interior Finish, Less Cost

By WALTER J. POUCHOT, Superintendent, Struck Construction Co.

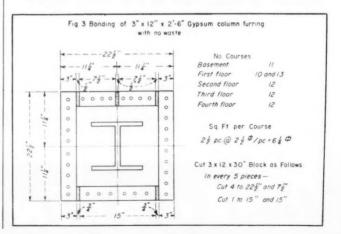


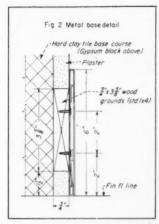
BY SETTING UP AN OPERATION out of usual sequence, and by an intelligent use of masonry materials, contractors for Kentucky's new Capitol Annex have made some nice savings on interior finishing costs—better than \$4 per column, for example. The main trick was to set pre-assembled wood plastering grounds before back-up masonry, rather than after. This eliminated all chopping and plugging. And the masonry itself was either standard size units or else pre-cut, so waste was virtually eliminated.

The Capitol Annex in Frankfort is a 260x460-ft steel-frame structure with four office floors and

basement. Its steel columns—including 1,100 isolated interior ones plus those engaged in exterior walls—are generally 16 ft on centers both ways. They were to be enclosed to end up 24 in. square, regardless of whether the finish was plaster or glazed bricktile. This would leave 14 ft clear between columns. And that dimension had to be held accurately to permit free interchange of steel office partitions that subdivide more than 400,000 sq ft of floor.

The wood grounds that insured this accuracy at the isolated columns were made up in advance in the job carpenter shop. They were simple box-like frames of stand-





ard 1x4-in. lumber (Fig. 1). The frame's supporting legs were spaced to fall in the joints of the hard clay tile base course on which gypsum block furring was subsequently laid up. In addition, the legs were fish-tailed so that mortar in the joint would hold the ground in place.

The prefab grounds were put in approximate position by a layout carpenter. Then a layout mason lined them up and set them to exact position to match marks established by transit on painted spots on the floor slab. He next set base course tile and mortared it in.

Early in the job the ground frames were set in mastic, but this proved to be wasted effort. It was found that the tile and mortar of the base course would hold the frames perfectly. And they could be pushed and tapped to exact position in the still-green mortar.

Setting up the base ground in advance worked so well for isolated columns that a similar scheme was adopted for engaged columns in brickwork and engaged columns and furred wall behind stone. Ground frames for these partially exposed columns also were prefabricated, but of course were only three-sided. Straight-run grounds for walls were made up with their fish-tailed legs at two-tile intervals. These grounds were joined in the field to those at the columns.

When all plastering was complete, metal base was attached to the grounds (Fig. 2). The finished walls and columns were so accurate that nearly all of this base could be pre-cut to standard lengths for simplified installation. An intelligent use of masonry

(Continued on page 124)

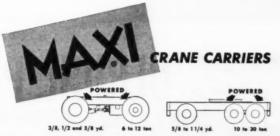
MAX - MOUNTED CLAMSHELL*



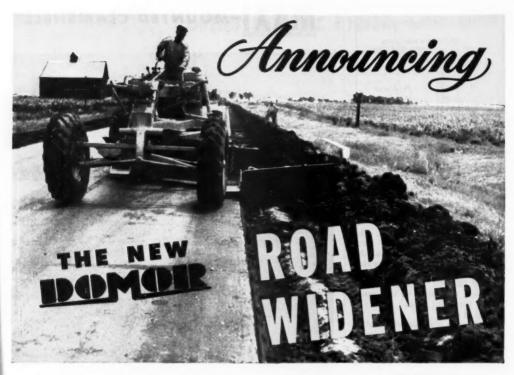
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- operation stability through 360°
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Two blade passes and two passes with the Domor Road Widener produce a trench that is level, clean, compacted and ready to take concrete. Pouring of excess concrete is eliminated. This unit is working on Jansen & Schaffer's Rt. 116 project in Ill.

Quickly attached or detached, the Road Widener is operated by regular Grader controls and is adjustable in depth and width. Note clean edge of old pavement and trench bottom — no undercultion necessary.



A NEW TOOL TO SLASH ROAD WIDENING COSTS!

Expensive hand labor is out with the new Domor Road Widener — a blade attachment for "Cat" Motor Graders. This new, patented tool prepares a trench, ready for concrete, in four Motor Grader passes. Dirt is sidecast out of the way... the trench bottom is precision level and clean... the old pavement edge is "scoured" and ready to provide a good bonding edge — no excess concrete need be poured! One man — on one grader — does all the preliminary work before paving crews start pouring. Costs are less than half of previous methods.

Lower your next road widening bid and still do the job with greater profit. See your "Caterpillar" Dealer for full information on the Domor Road Widener — today . . . or write direct.

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ULRICH PRODUCTS

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ROANOKE, ILLINOIS



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When you're after record yardage, a smooth flowing line is just as vital . . . so we took a tip from the fisherman, and made our reels friction-free. You can 'cast' the dragline bucket further, increase your radius of efficient operation from each location. You can bring in bigger catches, because more power is going into the work lines and less into friction drag on the machinery. And there's further big benefits from reduced maintenance . . . less frequent lubrica-

tion, and smoother operation, because misalignment from bearing wear, that affects clutch alignment and functioning, is eliminated.

Lima pioneered the use of anti-friction bearings at all important bearing points on draglines, shovels, and cranes. They've kept on pioneering with other improvements that put Lima equipment in the top rank of profitable performers. If you want proof of this—just ask the Lima user. If you want details on how to put Lima equipment on your pay-off roll... just get in touch with us.

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CONSTRUCTION EQUIPMENT DIVISION

LIMA, OHIO, U.S.A.



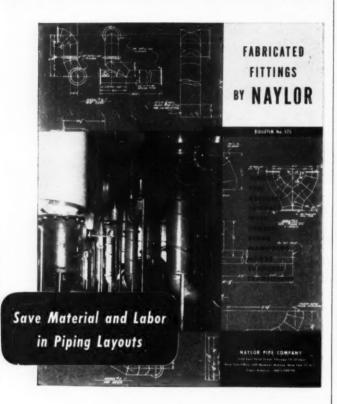
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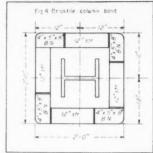
Write for this helpful bulletin on Naylor Fabrication Service. It presents data on standard and special fittings for lightweight pipe and offers practical ideas to simplify piping layouts. Included are special fabrications to save time, material and labor through eliminating numerous flanged joints and combining many fittings into one integral unit. Ask for Bulletin No. 525.



Naylor Pipe Company 1268 E. 92nd St., Chicago 19, Ill. New York Office: 350 Madison Ave., New York 17, N.Y.

INTERIOR FINISH

. . Cont. from p. 121



units also helped cut costs. The scored and cored hard tile base course, for example, was all of standard sizes and designed for laying without cutting (Fig. 1). Above the base course, columns were furred with gypsum block. This was all pre-cut by power saw from a standard 3x12x30-in. block, with no waste (Fig. 3, page 120). Where bricktile wainscot was involved, the layout was made using just two standard shapes without cutting (Fig. 4). The gyp-block furring above the wainscot was laid as for the all-plastered columns.

The good grounding and masonry operations resulted in long lines of columns accurate in size and in perfect alignment—a goal difficult to attain with conventional methods except at extra-high costs. Yet this extraordinarily exact job showed savings over even an ordinary one. The out-of-sequence grounding (ahead of masonry) eliminated chopping and plugging, while the masonry setup eliminated measuring and spot cutting. Direct savings on each isolated column figured out at about:

Material .							z			\$.60
Mason lab	0	r									1.35
Carpenter]	la	b	0	r						1.75
Rubbish .	,										.35
Total										S	4 05

And this does not include indirect savings, such as that on insurance. The masonry operation on engaged columns and wall furring also showed worth-while savings, although not as great as on isolated columns. However, the grounding operation was just as economical throughout. It all added up to a much better job at much less than usual cost.

General contractor for the State of Kentucky's \$6,000,000 Capitol Annex structure is Struck Construction Co., of Louisville. The author, who devised the procedures described, is job superintendent.

"I don't see how we could operate without Motorola 2-Way Radio"



MORE THAN EVER— MAINTENANCE AND CONSTRUCTION MEN CONSIDER INSTANT 2-WAY RADIO AS PRIMARY "OPERATING MACHINERY"!



A Hard-Hitting, Quickly Applied Construction Tool.

The Uni-Channel can be used as a fixed or fully mobile station. Easy to set up and easy to operate. Just plug in, connect antenna and go to work. The Motorola Permakay filter eliminates 15 nuisance tuning adjustments forever.

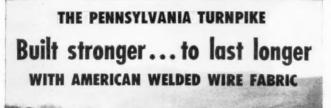
In any wide-spread, hard-driving operation you can count on Motorola 2-way radio to get machines and men on the job faster, keep supplies moving. Motorola mobile radio will streamline your operation, boost your efficiency.

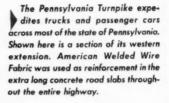
More and more construction men are finding that Motorola equipment pays for itself after only a few months' operation. Motorola engineering gives you dependable performance, lowest maintenance costs and obsolescence-proof circuits that protect your investment for years to come.



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You use less steel, less concrete, with American Welded Wire Fabric, to provide slabs of equal structural strength. You save on labor too, because American Welded Wire Fabric is prefabricated, hence can be quickly and easily laid, continuously — to form longer road slabs—with fewer hands, in less time. Also there is less material to transport and unload at the job.

Many standard designs, styles and sizes of American Welded Wire Fabric are available from conveniently located jobber's and dealers' stocks. Our technical staff will be glad to supply specially engineered solutions to any special reinforcing problems you encounter in any type of concrete construction. Meanwhile,

drop a line to our nearest sales office for a copy of the American Welded Wire Handbook,



ment reduces the rate of cracking.
It minimizes progressive damage to slabs and subgrade, by keeping cracks rightly closed. It prevents beaving, spalling and pumping. You get better road performance, longer trouble-free service, hence rock bottom economy, with American Welded Wire Fabric.

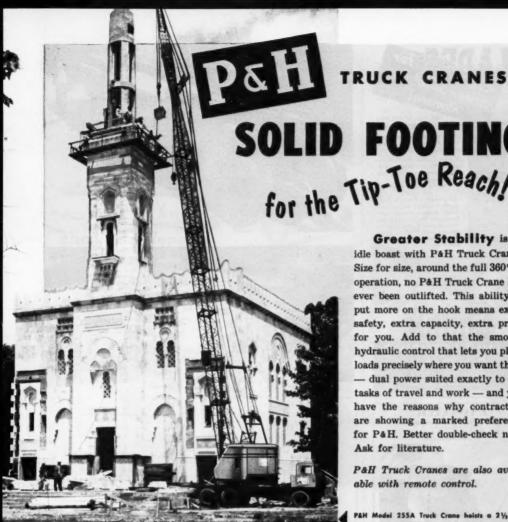
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idle boast with P&H Truck Cranes. Size for size, around the full 360° of operation, no P&H Truck Crane has ever been outlifted. This ability to put more on the hook means extra safety, extra capacity, extra profit for you. Add to that the smooth hydraulic control that lets you place loads precisely where you want them - dual power suited exactly to the tasks of travel and work - and you have the reasons why contractors are showing a marked preference for P&H. Better double-check now. Ask for literature.

P&H Truck Cranes are also available with remote control.

P&H Model 255A Truck Crone hoists a 21/2 ton block, with 90 feet boom and 30 feet jib. This mosque, in Washington, D.C., is the first ever built in the U.S.

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Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.



















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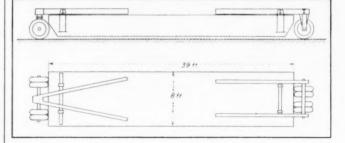
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Special Delivery for Bridge Beams

PRECAST CONCRETE SLABS with two integral beams apiece were transported in a novel way in Rio de Janeiro to become bridge platforms across a stream.

The city government contracted with Engenharia Civil E Portuaria S. A. to construct five bridges across the Maracana River to ease the movement of crowds from the local sports stadium. Casting and placing of the 34 beams required was completed in 40 days.

The integral slab-beams were cast on a street adjacent to the bridge sites. Hauling to the site

was done by suspending the beams front and rear from steel I-beam supports mounted separately on rubber-tired four-wheel dollies. Each beam is 39 ft long and 8 ft wide: weighs 24 tons.

At the site, two P&H 655 cranes—operating in unison one on each side of the narrow stream channel—lifted the beams from the transport dollies and positioned them accurately side-by-side.

The sketch shows side and plan views of the loaded trailer. Photos show a beam in transit and final placement by the two cranes.



Every CUMMINS DIESEL is built not once but twice



Construction men in the field have learned to count on Cummins Diesels for dependable power day in, day out.

What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built twice. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice for men who depend on power.

Whatever your power needs . . . whether it's for earthmoving, portable power units or generator sets . . . or any other important jobs . . . your Cummins dealer is the man to see.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Export: Cummins Diesel Export Corporation Columbus, Indiana, U.S.A. • Cable: CUMDIEX (c. 41)

Leaders in lightweight, high-speed diesel power!





ANOTHER BREAK IN THE DIKE!

Tough words to hear when you're battling a river on a rampage. But that's what happened during the recent disastrous floods on the Fraser River in British Columbia.

Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience again proves the unusual mobility and handling ease of MICHIGAN cranes.

. Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavatorcrane...investigate MICHIGAN...you'll agree it's your best buy!

MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U.S.A.

Legal Decisions Concerning Construction

The Illinois Surplus

IF A AGREES to give a contractor a check for a certain amount, and, before the check is given the bank on which it is drawn, unconditionally promises in writing to accept the check, this is an actual acceptance in favor of every person who receives the check for value upon the faith of the promise. It follows, therefore, that if the bank agrees to accept a check for \$1,000, and the check, when presented, calls for \$1,100, the bank is not bound by its acceptance.

Suppose, however, that the check is signed by the drawer's agent, the bank refuses to honor the check on the ground that the agent had no authority to sign it, then it transpires that the agent actually had authority, and the contractor, the holder of the check, sues the bank on its acceptance.

"The check was drawn for more than the stipulated amount, therefore our acceptance is not binding on us," the bank contends.

"You're too late in raising that point now, when you refused payment on a different ground," the contractor retorts, and the Illinois Courts have ruled in his favor in Huston vs Newgass reported in 84 N. E. 910.

The Home-Town Contract

THE CONTRACTOR had entered into a paving contract with his home town but ran into difficulties.

"We have a state statute which provides that municipal officers shall not be interested in municipal construction contracts, and three out of eleven members of the City Council are employees of the contractor," certain objectors pointed out.

"The contract was made in good faith, at a fair price and is for the benefit of the City," the contractor protests, but the Illinois Supreme Court ruled that the contract was void in the case of People vs Sperry, 145 Northeastern Reporter 344.

"If the contract is one that the statutes declare to be void under the law, we must declare it void, even though it may further appear (Continued on page 132)





Southwest Compaction Rollers

SET NEW RECORDS for compacting heavier lifts with fewer passes. On the big jobs where maximum compaction is required the Southwest gets the work done quickly and efficiently.

Weight-box units of Southwest Compaction Rollers oscillate up and down independently and provide a constant, uniform compacting load on each tire regardless of ground contours. There is no bridging, no shifting of load from tire to tire.

Sectionalized tubular yoke allows the use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 100 tons, suitable for light, medium or heavy duty compacting of earth.

Write for information





shorter, more compact design and other important features make the new Ramser JOBMASTER the unmatched tool for high-speed, low-cost, effortless fastening into steel, concrete and other approved materials.

On-the-job experience (not stop-watch laboratory figures) shows less than a minute per fastener from start to finish—faster on continuous work. Most jobs prove dollar savings up to 75%, time savings up to 90%. For almost any kind of construction fastenings, nothing sets like Ramser!

Tru-Set Fasteners hit the spot

Guided by the exclusive, elasticized Red-Tip Pilot, Tru-Set Fasteners go straight to the work—penetrate and hold tightly at the exact spot designated. With 54 sizes and types of Tru-Set drive pins and threaded studs, you can select just the one you need for any specific job.

For new ease, new speed, new utility, new economy, ask your dealer today to demonstrate RAMSET JOBMASTER and Tru-Set Fasteners. Or, write us for details.

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roduct Patent No. 2470117. Other Patents Pending.



LEGAL DECISIONS . . .

Cont. from p. 130

that the contract was as good a contract on behalf of the city as it could have obtained—that is, that the consideration for the work performed was as low as could have been obtained.

"If we attach any significance to the words used by the statute, 'directly or indirectly interested in the contract,' we think the conclusion cannot be escaped that the officers of the city, who are also employees of the contractor, must be considered as indirectly interested in the contract, without regard to the fact that they derived no direct benefits from the contract itself. They would be more than human if they could make the same fair and impartial contract with the contractor as they could with another party with whom they had no relation by way of employment or otherwise. We have no doubt that the officers, who signed and participated in making the contract, did so without any intentional bad faith, and that the same is true of the contractor; still, we are clearly of the opinion that the Court properly held that the contract was void within the provisions of the statute. The three city officers, who signed on the part of the city, had such an interest in the business and welfare of the contractor in this case as would naturally tend to effect their judgment in their determination to let the contract. and to pass upon the question whether or not the same was completed in full accord with the terms thereof," was the ruling of the Court.

Stock-Paying in Work

"THAT NEW HOTEL we're starting in town'll be a great thing for the country," the salesman averred, "and we're counting on you for \$1,000."

"I've got no money to buy any stock in anything."

"No—but you do much work of the type the hotel will be needing." "Yes, the best in the county."

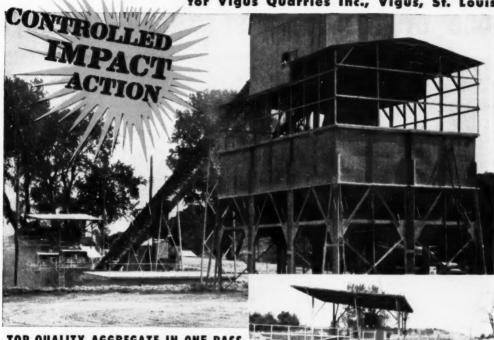
"So we've heard. Now, if you'll take \$1,000 stock and agree to furnish the hotel with the usual minor repairs it'll need for the first year it's running, the stock won't cost you a cent'a money."

"I've bought," the contractor agreed.

"We'll have to have your note for the \$1,000 and we'll give you a written agreement about the paying in work," the salesman suggested, (Continued on page 135)

Fred Weber Jr. chooses

or Viaus Quarries Inc., Vigus, St. Louis



TOP QUALITY AGGREGAT THROUGH PMCO IMPACT MASTER

Fred Weber Jr. has proof of PMCO Impact Master performance. He's producing 135,000 tons of top quality concrete aggregates to meet CAA and City of St. Louis specifications for airport runways.

Feeding with three trucks, Vigus Quarries Inc. are averaging 175 tph of crushed aggregates. That's 150 tph of specification material with 40% of 21/2" down to 11/4", and 60% of 11/4" down to 1/8"; and 25 tph of base rock and aglime. Mr. Weber is enthusiastic about the performance. He says, "We've fed the Impact Master peak loads with additional trucks and we know it has the capacity to turn out

Top capacity with greater control over finished product size . . . that's what Controlled Impact Action gives you in the PMCO Impact Master. Its high ratio of reduction eliminates secondary

crushers and auxiliary equipment and lets you step into big volume production with minimum plant investment. PMCO Impact Masters have capacities up to 500 tph. Write today for profit-making details on the size that meets your requirements.

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Indiana constructs heavy-duty Texaco Asphaltic Concrete on

one of the Midwest's main highways



Traffic on this 11-mile section of U. S. Route 52 north of Indianapolis, Indiana, is now served by a resilient, heavyduty Texaco Asphaltic Concrete pavement.



Where US-52 cuts across the State of Indiana, it becomes the principal highway used by traffic between two of the midwest's largest cities, Chicago and Cincinnati.

An 11-mile section of the highway north of Indianapolis had failed to the point that it no longer provided a satisfactory riding surface. The aim of the Indiana Highway Department was to improve this section so that it would be fully adequate for modern traffic, at reasonable cost. A resilient, heavy-duty Texaco Asphaltic Concrete surface, laid over the existing pavement, has met the State's requirements in all respects. The new Texaco surface was put down in two courses, binder course and wearing surface, each 1½ inches thick.

Whether road builders are constructing an asphaltic concrete pavement in Indiana, an asphalt penetration macadam road in Connecticut, a sand asphalt project in Florida, or giving a Texas highway a double asphalt surface-treatment, you will find them using Texaco Asphalt products this year, as they have been doing for almost half-a-century.

Products of scientifically selected crudes, Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils deliver consistently good results in whatever type of asphalt road, street or airport construction they are used.

Write for our two booklets which furnish helpful information on the various types of asphalt construction.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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TEXACO ASPHALT

time passed on, and when the note fell due the hotel company was in bankruptcy—the receiver demanded the face of the note in cash from the contractor, and the latter fell back on the agreement.

"The agreement was that I was to pay in work." he argued.

"Yes—but the hotel's on the rocks and we don't want any work," retorted the receiver, and the Supreme Court of South Carolina in Baber vs DeCamp reported in 6 A. L. R. 376 decided that under these circumstances the contractor was bound to pay in cash, and could not set up an agreement that it was to be paid by work or goods which were afterward found to be unnecessary because of the insolvency of the company which was the pavee of the note.

"The fact that the rendition of the services became unnecessary by reason of the company's insolvency, did not absolve the maker of the note from liability thereon, merely because he was ready and willing to render the service in question," said the

The Outlawed Note

AN INTERESTING SITUATION arises when John Doe gives the contractor a note in April 1936, payable in June 1936, Richard Roe endorses the note in September 1936, and the contractor sues Richard Roe in July 1942.

"The note's outlawed—it's been due more than six years," Roe contends

"The six years start to run, not from the due date, but from the date of your endorsement, so I'm on time," the contractor argues.

This point came before the Supreme Court of Colorado in Colley vs Rowan reported in 203 Pacific Reporter, 669, and the Court ruled in the contractor's favor.

"The endorsement of the note is not merely a transfer thereof, but it is a fresh and substantive contract, embodying the terms of the instrument endorsed in itself. So entirely distinct and independent is the contract of the endorser of a note from that of a maker that at common law a separate action against each was indispensable," said the Court.

"That the statute of limitations begins to run from the endorsement, where, as in this case, the endorsement is made after the delivery, and not as a part of the original transaction, follows as a consequence of the above statement."



Allis-Chalmers HD-20 Tractor

gives Higher Outile Exclusive Hydraulic Torque Converter

Drive Is One BIG Reason Why

The hydraulic torque converter drive, exclusive in the Allis-Chalmers HD-20 Tractor, brings you productivity, handling ease and dependability that makes every hour, every day of the season count . . . gives the operator the equivalent of hundreds of gear ratios in two speed ranges . . . automatically selects the proper speed for maximum production.

Dozing

With hydraulic torque converter drive you take full advantage of available horsepower... roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs... longer life of tractor and auxiliary equipment.

Pulling

There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

Excavating

With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

Pushing

The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.

ALLIS-CHALMERS

Weight: 41,000 lb 175 Net hp. at flywheel with LESS UPKEEP

Originator of the Torque Converter Tractor

FOR EASY CONTROL, SURE-GRIP HANDLE IS KEPT MINIMUM DISTANCE FROM BLADE. IT'S CLOSE TO CENTER OF GRAVITY FOR GOOD BALANCE.

HUSKY DIE-CAST ALUMINUM HOUSINGS GIVE LIGHT WEIGHT PLUS DURABILITY. MAN-SIZE SHOE GIVES FIRM SAWING PLATFORM.





Black & Decker

The Black & Decker Mfg. Co., Dept. H-659, Towson 4, Md.

FLOW SO SAWDUST IS BLOWN CLEAR OF GUIDE LINE.

SALES AND * SERVICE *

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Bucyrus-Erie Co.: Has appointed two new distributors to handle its line of 3k- to 4-yd gasoline, diesel and single-motor electric, convertible excavators, as well as the Hydrocrane, Hydrohoe and Red Arch dragline buckets. The Border Machinery buckets. Co., 1710 E. Paisano Dr., El Paso, Tex., will handle the counties of Grant, Hidalgo, Luna, Dona Ana, Otero, Eddy and Lea in New Mexico and El Paso, Hudspeth, Culberson, Reeves, Pecos, Jeff Davis, Presidio, Brewster and Terrell Counties in Texas. The Richardson Tractor Co., 601 50th St., Kanawha City, Charleston, W. Va., will cover West Virginia except the panhandle counties of Hancock, Brooke, Ohio and Marshall, plus the three most westerly counties of Maryland-Garrett, Allegany and Washington.

Wilson-Albrecht Co., Inc.: Exclusive distribution rights for "Waco" brand sectional steel scaffolding equipment in Eastern Arkansas, Northern Mississippi and Western Tennessee, have been granted the Billingsley Floor and Blind Co., 207 S. Cooper, Memphis, Tenn. A separate Waco divi-sion will be established by this firm to merchandise the complete line of Wilson-Albrecht scaffolding, mason and scaffold jacks, material hoisting towers and portable elevators on a rental and sales basis.

Thew Shovel Co.: Has appointed Head and Guild, 5501 Navigation Blvd., Houston, Tex., distributor in the Houston area for Lorain selfpropelled, as well as truck- and crawler-mounted cranes.

United States Plywood Corp.: Has opened a new sales and distribution unit in Columbia, S. C. Albert M. Hill, Jr., former sales representative at the company's branch in High Point, N. C., was named manager of the new unit.

Huber Mfg. Co.: Has appointed two new distributors to handle its line of road maintenance equipment. Brinker Supply Co., 135 N. Broadway, Dover, Ohio, a branch of the Pittsburgh office, will handle the company's complete line in 14 counties in southeastern Ohio. A. E. Hudson Co., with home offices in

Morton, Ill., and branches in Rock Island and Springfield, will handle Huber's entire line of tandem and 3-wheel rollers and the versatile Huber Maintainer. Its territory will cover central and northwestern Il-

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc.: Announces the establishment of a new stock carrying branch warehouse and sales office serving the Pacific Northwest. The new warehouse is located at 2360 N. W. Quimby St, Portland 10, Ore., and will be under the supervision of Milton M. Clark, District Manager.

On the Sales Front

A. O. Smith Corp.: John J. Redmon has been appointed manager of the A. O. Smith Product Service branch at Dallas, succeeding Ben Heald who is returning to full time sales activity for the company. J. W. Rushing has been appointed assistant manager.

Frank G. Hough Co.: Announces the assignment of two new district representatives replacing Jim Suter who has become associated with Cornhusker Tractor and Equipment Co., Hough distributor at North Platte, Neb. Dan Daily will headquarter at Minneapolis and cover North and



says M. C. Warmbier, Project Manager, Bates and Rogers Construction Co.

The new B. & O. railroad tunnel near Clarksburg, W. Va. was a tough concrete placing job . particularly the 3-foot-high ballast wall on both sides of its entire 3236 foot length.

"Three Dumpcretes mounted on 11/2' sub frames drove along the wall and placed directly into the forms through standard 13-foot chutes,' reports Mr. Warmbier. Nothing could beat Dumpcretes for this job."

Concrete totalled 30,000 yards, including that used for sides and roof.

To settle dust, one body was converted into a combination concrete hauler and water wagon by the addition of a spray bar at the rear. Send coupon today for more interesting facts on 2, 3 and 4-yd, models.



Fastest from

MAXON UMPCRET



Manufacturing Division Maxon Construction Co., Inc. 643 Talbott Bldg., Dayton 2, Ohio

"Dumpcrete High-production Method"

City.

South Dakota, Minnesota, Iowa, Wisconsin and Upper Michigan. Dick Lewis will be located at Kansas City and cover Western Missouri, Wyoming, Nebraska, Kansas and Colorado. Both men will work with Hough distributors in the applica-tion of "Payloader" tractor shovels and tractors.

Ball Distributing and Engineering Co.: Distributor of Gustin-Bacon Mfg. Co.'s Ultralite glass fiber insulation, has recently expanded its territory to include a warehouse and sales office at 819 N. Olie St., Okla-homa City. Glenn Hughes, vicepresident, will be in charge of this branch, Bill Linihan will be the new office manager.

Clipper Manufacturing Co.: Robert G. Evans, one of the original founders of Clipper, has announced the formation of a new company to distribute masonry and concrete sawing equipment. Headquarters for this organization, the Robert G. Evans Co., will be at 6315 Brookside Plaza, Kansas City, Mo.

Syntron Co.: The Syntron Chicago Sales Co., representing and selling Syntron vibratory material handling equipment, power tools, Selenium rectifiers, paper joggers, shaft seals, etc., in the Chicago area, have announced the opening of a new store at 236 N. Crawford Ave., Chicago 24,

Champion Spark Plug Co.: Has appointed E. F. R. Horner to the newly created post of sales promotion man-

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc.: Has established a new stock-carrying branch warehouse and sales office at 2201 N.
Washington Ave., Minneapolis, Washington Ave., Minn., to provide better service and deliveries to customers in the growing Twin Cities industrial area.

Calaveras Cement Co.: Charles W. Lindgren, formerly resident engineer at California's Pine Flat Dam, has been appointed sales engineer for the company in Sacramento, and will serve contractors, state and federal offices in northern California and western Nevada. The company's sales representative at Chico, Calif., William Wadlington, who has been

(Continued on page 142)





controlled by the operator. Regardless of blade tilt or angle, Baker's superior design provides straight-line force through hydraulic cylinders to blade—permitting nearly entire weight of tractor to force blade straight down to pay dirt!

builders and Root Rippers-all interchangeable-is manufactured exclucively for Allis-Chalmers tractors. Three mountings are available: Engine-mounted hydraulic; framemounted hydraulic (the revolution-9-X "no-pushbeam" 'Dozer), and cable-controlled types.

Contact your Baker, A-C Dealer today and ask for a demonstration of down pressure to profits.



Baker — The most versatile line of tractor attachments



Construction of bituminous highway with SEAMAN TRAV-L-PLANT.



WYOMING
Gravel stabilization. SEAMAN blends
and proportions gravel, corrects segregation.



Two SEAMAN Self-Propelleds mixing bituminous bound-gravel on 2 lane highway. Each lane 25' wide, 16 miles in length.



GEORGIASEAMAN Deep-Mix Pull-Type Model (D-67) mixing 18" compacted depth.









NEW YORK Self-propelled follows distributor closely to prevent migration.



SEAMAN Self-Propelled in shoulder stabilization.



CONNECTICUT
SEAMAN TRAV-L-PLANT mixing for bituminous shoulders.



NORTH CAROLINA
SEAMAN Self-Propelled in send-clay
stabilization.



280 N. 25th ST. MILWAUKEE 3, WIS.

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better... Gives
Longer Service at Lower Cost

Specially Designed for Efficient Service on Shovels — Excavators — Drag-lines Roadbuilding Equipment Locomotive Cranes — Tractors

"Built to take it," say users of STURDILITE
Heavy-Duty Flood Lamps, after years
of trouble-free service. Hermetically sealedbeam lamp—no reflector to become tarnished.
Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks.
Available in 6-8, 12-16, 24-28 and 110-120
voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.



Vibration-absorbing Base



Metal Spinning Division PHOENIX PRODUCTS COMPANY

4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN



SALES AND SERVICE . . .

Continued from page 140

on military leave since January, 1951, has reopened his office and will serve the territory from Chico and Marysville north to the Oregon border.

Harnischfeger Corp.: Announces the appointment of two district managers. Al Hoehler, formerly district manager of the Boston office, becomes district manager at Pittsburgh. Irving Shapiro replaces Mr. Hoehler as district manager of the Boston office.

Davey Compressor Co.: Jack W. Kiddy has been appointed east-central district manager in charge of company operations in northern Ohio, Michigan (except the northern peninsula), western New York, northwestern Pennsylvania, and the Province of Ontario, Canada. His headquarters will be in Kent Ohio.

Heil Co.: Announces a revision of the district sales territories which requires the opening of two new district office locations and numerous personnel changes in the company's field sales organization. New offices will be opened in Cleveland and Denver. Personnel changes include: Robert Rose, formerly district representative working out of the Hillside office, becomes district manager of that office; Fred Wrede, formerly special representative working out of the Washington office, becomes district manager at Washington; William Schumacher, formerly district manager of the Hillside office, becomes district manager at Cleve-land; Herbert Erdman, formerly assistant sales manager of the Tank Div., Milwaukee, becomes district manager of that office; John Zimmermann, formerly district representative working out of the Milwaukee office becomes district manager of the Denver office; D. J. Kuhlman, formerly manager Chicago National Accounts Office, becomes district manager of the Chicago office.

Jahn Trailer Div., Pressed Steel Car Co.: Announcement was made recently by J. G. Watson, manager, that the division sales office has been moved to its Hegewisch plant at 136th St. and Brandon Ave., Chicago 33. Ill.

Worthington Corp.: Named Paul J. Foley manager of its Kansas City office and William M. Fine manager of its Milwaukee branch office.

Nordberg Manufacturing Co.: An nounces territorial change in the West Coast operations of the Crusher and Process Machinery Division. T. D. Davis, as Western branch manager, will be in charge of the company's entire West Coast operation, including the Northwest territory, formerly under the jurisdiction of G. E. "Gunnar" Jarpe. Mr. Jarpe was

Like Sunshine and Swimming

they Go Together





An Austin-Western Power Grader—without attachments—works more hours per year than ordinary graders... with attachments its uses are multiplied, and its values increased tremendously.

Heavily made and reinforced to accommodate the extra power and traction of All-Wheel Drive and Steer, the Bulldozer is a time- and money-saver on dozens of jobs. Rear steer can be used to offset the frame and give the effect of an angledozer.

Fast...easily operated by smooth hydraulic control...never in the way on other work... the Bulldozer is an excellent example of the fact that any attachment—front, center or rear mounted—is doubly effective on an Austin-Western Power Grader, thanks to exclusive All-Wheel Drive and All-Wheel Steer.

AUSTIN-WESTERN COMPANY Subsidiary of Baldwin-Lima-Hamilton Corporation AURORA, ILLINOIS, U.S. A.



o o WANTED

More production with limited manpower

IT CAN BE DONE!

... with faster drilling CARSET JACKBITS



Because they are tipped with Carboloy inserts—one of the hardest metallic substances known to man—Carset Jackbits drill the hardest rock with a speed and efficiency which cannot be approached by the finest steel bits.

For instance, Carset Jackbits drill 50% faster—last from 50 to 400 times longer—practically eliminate bit changes and double the life of drill steel. They eliminate tapered holes saving up to 30% on dynamite—permit longer steels and feeds—require much less maintenance—and boost tonnage as much as 50% or more.

These advantages all add up to a tremendous increase in footage per shift—without increasing your drilling crews. Remember Ingersoll-Rand offers a complete line of equipment and service for rock drilling. Take advantage of our highly trained and skilled personnel. There is an Ingersoll-Rand branch office and distributor near you. Write or call today.



Ingersoll-Rand

632-15

ROCK DRILLS . COMPRESSORS . AIR TOOLS . TURBO BLOWERS . CONDENSERS . CENTRIFUGAL PUMPS . DIESEL & GAS ENGINES

SALES AND SERVICE . . .

Continued from page 142

recently transferred to Duluth, Minn., as district manager of the North Central territory. Mr. Davis will retain his headquarters at the company's San Francisco branch office and will be assisted by J. W. Crandall and L. O. Makholm, sales engineers.

U. S. Radiator Corp.: Howard B. Steggall, vice-president since 1945, has been appointed senior vice-president. In his new capacity, Mr. Steggall will have direct responsibility for sales, manufacturing and engineering, advertising and industrial relations for the U.S., Pacific, Cyclotherm and Metal Products Divisions.

Republic Rubber Division, Lee Rubber & Tire Corp.: Richard N. Benson, Peter D. O'Neill and Stephen P. Terlecky have been promoted to the position of field engineers. Messrs. Benson and O'Neill have been assigned to the Chicago district office; Mr. Terlecky to the Philadelphia district office.

The Heil Co.: Paul Miller, formerly sales manager of the Washington, (D.C.) office, replaces his brother, Robert Miller, as road machinery sales manager in the home office, Mil waukee, Wis. Robert Miller has resigned to become sales manager of the Innes Equipment Ltd., Toronto—Heil road machinery distributors in the eastern part of Canada.

Viber Co.: Announcement has been made of the appointment of J. A. Robinson as sales manager. In this capacity, he will work with distributors of Viber's high-frequency internal and external vibrators across the nation, with particular attention to the market east of the Mississippi.

Alloy Steel Products Co., Inc.: Appointed E. J. Lickwar as sales representative in the Pittsburgh, Pa., area, replacing Herbert V. Evans, Jr., who was recently made district manager for the company at Wilmington, Del.

Fageol Heat Machine Co.: Announces the appointment of Robert P. Kloeckner as sales representative in Chicago. He will handle distribution and sales in Illinois, Wisconsin and Minnesota.

Zonolite Co.: Appointment of Robert Upchurch to the sales territory of Hamilton county, Ohio, and Campbell, Kenton, and Boone counties, Kentucky, has been announced.

Motorola, Inc.: Has established a new West Coast parts and service department located at 811 South B St., San Mateo, Calif. This new organization will be under the management of John Jipp, and will provide Motorola's customers in a nine-state western area with complete, modern service facilities. Regiona! sales of-

Leaders IN PERFORMANCE AND DEPENDABILITY

QUICKEST PRIMING
FASTEST PUMPING
NEVER QUITS



PRIMING ACTION

LOOK INSIDE THE PUMP



Contractors' Pump

Bulletin 8-CP-11

furnished

on request.

Gorman-Rupp Pumps have no equal in the Self-Priming Centrifugal Field. The Simplest Pumps built, streamlined inside where streamlining counts -- nothing to cause stoppages, nothing to reduce capacity.

In Gorman-Rupp Pumps the self-priming feature has reached its highest achievements.

Note the priming action illustrated above. The air and water are discharged through channel "A" into the chamber, where the air escapes from the water. The heavier air-free water is pulled downward again through channel "B" to the impeller where more air is entrained, discharged upward and released until the priming cycle is completed.

Gorman-Rupp pumps will pump more dirty water, more hours, with less fuel than any other self-priming pump. Being practically trouble-free they require a minimum of maintenance.

Contractors' Pump Bulletin 8-CP-11 furnished on request.





Guessings fine for Fairs - or trips to Waikiki-BUT IT'S DEADLY TO GUESS ON MIXERS. That's why lead-TO ing architects, engineers and contractors insist on A.G.C. rated mixers. To wear the A.G.C. plate, mixers and pavers must meet rigid specifications as to sizes and mixing capacity. Always look for the A.G.C. Rating Plate when you buy.



Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY CONSTRUCTION MACHINERY CO. THE FOOTE CO., INC.

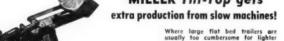
THE JAEGER MACHINE CO. Columbus, Ohio THE KNICKERBOCKER CO.

KOEHRING COMPANY Milwoukse, Wis.

KWIK-MIX COMPANY Port Washington, Wig. THE T. L. SMITH COMPANY

WORTHINGTON PUMP AND MACHINERY CORP. Construction Equip. Div., Dunellen, N. J.

"the SHORTEST TIME" between jobs MILLER Tilt-Top gets







IMMEDIATE DELIVERY

SEE YOUR DEALER OF WRITE Dept. C-9, 457 SOUTH 92nd ST. MILWAUKEE 14, WIS.

fice of the Communications and Electronics Division and the West Coast distributor headquarters for the Consumer Products Division are located in the same building.

Templeton, Kenly & Co.: Phillip H. McManus, formerly general sales manager, was elected vice-president in charge of sales. William H. Zepp will assist Mr. McManus in Illinois, Indiana, Iowa, Kansas, Michigan, Missouri and Wisconsin. N. L. Montgomery was appointed manager of mining sales in southern Indiana, southern Ohio, Kentucky, Pennsylvania, West Virginia, and Virginia. He will be assisted by Richard S. Bowers of Huntington, W. Va. William D. Boldt, Southeastern division sales manager with headquarters in Atlanta, Ga., has been assigned the states of Arkansas and Louisiana, in addition to his former territory. Arthur C. Templeton, whose headquar-ters are in Dallas, Tex., will cover Oklahoma and Texas

Dayton Pump & Mfg. Co.: John Gray, appointed district sales representative, will be in charge of sales for the entire Rapidayton line in Illinois and parts of Iowa, Indiana, and Wisconsin.

Wood Manufacturing Co.: Announces the appointment of A. W. Ginther as general sales manager.

Kensington Steel Co.: A. C. Erlandson has been appointed territorial sales engineer for lower Michigan, northern Illinois and southern Wisconsin. In this capacity, he will offer the company's complete line of Oro and special manganese steel products for quarry, gravel, mining, logging, brick and clay industries. Mr. Erlandson's office will be in Chicago.

In the Main Office

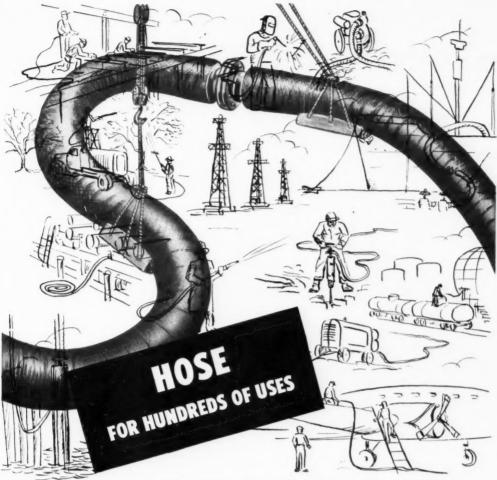
Republic Hardfacing Corp.: Ray A. Mentel is now vice-president and general manager. Gorham W. Woods has been appointed engineer in charge of the Industrial Hardfacing Division, a newly created division of the company.

Worthington Corp.: F. E. Peltier has been appointed manager of Central Regional Engineering and Service. with offices in Cleveland. Ralph M. Watson is the new director of research.

The Timken Roller Bearing Co.: The Board of Directors has elected John A. Riley to the post of secretary and treasurer. Mr. Riley succeeds to the position vacated by the late R. C. Brower.

Fairbanks, Morse & Co.: R. H. Morse III has been appointed general manager of the company's Beloit, Wis., works. Mr. Morse succeeds Orren S. Leslie who has been named Man-

(Continued on page 148)



The big hose shown here is suspended by booms and unloads petroleum from ship to shore. Whether your hose needs are standard or special, it's practically a certainty Raybestos-Manhattan engineers have already designed the right hose for you. R/M hose constructions range from as small as ½" paint spray hose to huge dredging hose big enough for a man to crawl through. The point is, you can't go anywhere to find better facilities or more experienced engineering to help you with a hose problem, than at Raybestos-Manhattan . . . and not only hose — it's true also of transmission, conveyor and V-belts . . . and all other products we make. Consult your R/M representative.

RM

MANHATTAN RUBBER DIVISION - PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.















Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks
Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bawling Balls



DELIVERING an average of more than 4,000 cu. yds. of solids per working day, this big Ellicott 12" hydraulic dredge saw plenty of action on a recent New Jersey road project. A total of 250,000 cu. yds. of wet material was removed, then 600,000 cu. yds. of approved fill was deposited for the road bed. Job report reads: "The project, which required the dredge to be moved overland from one site to another several times, was completed in just 8 months!"

Ellicott dredges are built for long-range, profitable service under all types of conditions... built to outperform all others on every basis! For more information, write for Catalog 825. Address: Ellicott Machine Corporation, 1605 Bush Street, Baltimore 30, Md.



SALES AND SERVICE . . .

Continued from page 146

ager of Manufacturing and has been transferred to the company's headquarters in Chicago.

Beaver Art Metal Corp.: Ralph W. McGrew has been elected president to succeed C. F. Maroney. Russell B. Cooper has been appointed to the position of sales manager.

Macwhyte Co.: Archie M. Naysmith, formerly plant engineer, has been appointed general superintendent and plant engineer. R. B. Whyte, Jr., is assistant general superintendent and assistant plant engineer.

Association Activities

Portland Cement Assn.: A. A. Anderson, former manager of the Highways and Municipal Bureau of the Portland Cement Association and nationally known technician in the concrete paving field, has been appointed Chief Highway Consultant of the PCA, with headquarters at the association's general office, 33 W. Grand Ave., Chicago. He is succeeded by L. M. Arms, former assistant manager of the Highways Bureau.

Vermiculite Institute of Chicago: Announces the appointment of L. A. Barron, engineer with the Institute, as manager of its new Technical Service Dept. James Spence will take over Mr. Barron's former duties, concentrating on building codes, representing the Institute on A.S.T.M. committees, taking care of inquiries and general work.

Special Mention

Syntron Co.: Has organized a Canadian subsidiary, Syntron, Ltd., and purchased a manufacturing plant in Stoney Creek (Hamilton area) Ontario, Canada. It is expected that production will start sometime in September or October of this year.

The James F. Lincoln Arc Welding Foundation: Announces a new competition for designers, engineers and manufacturers of machinery of all types. The new \$30,000 Mechanical Design Award Program offers \$30,-000 in 101 cash awards, as well as national recognition, for the best papers describing the mechanical design and construction of any type of machine or machine component which is designed for arc welded steel fabrication. The program closes July 27, 1953. The Rules and Conditions brochure is available from the Lincoln Foundation, Cleveland 17. Ohio

Allis-Chalmers Mfg. Co.: The board of directors of LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa, has approved an agreement and plan of reorganization with Allis-Chalmers. Acquisition of LaPlant-Choate will broaden the industrial line of the Tractor Division of Allis-Chalmers in earthmoving and other fields.

GULF PRODUCTS and **FINE SERVICE**

keep equipment rolling

on Georgia Air Base Project

Dickerson, Inc. of Monroe, N. C., and D. W. Winkelman Carolina Co., Greensboro, N. C., recently completed — well ahead of schedule—improvement of runway facilities at the Hunter Air Force Base, Savannah, Ga. Work involved 1½ million cubic yards of excavation, 180,000 tons of lime rock base, 75,000 tons of hot mix asphalt pavement, and incidental items. Mr. J. M. Nicholson, Vice President of the D.W. Winkelman Carolina Co., was in direct charge of this project.



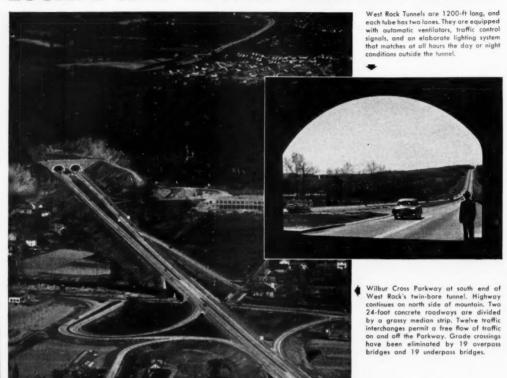
ASK leading contractors like Dickerson, Inc. and D. W. Winkelman Carolina Co. why they use Gulf products and you will get an answer something like this: "We feel that our equipment gains an edge in performance with Gulf lubricants and fuels—their extra quality is reflected in smoother, more dependable operation, and lower maintenance costs.

"Then Gulf provides a high type of engineering service to help us make sure that the most suitable lubricants and fuels are used for every unit and operating condition. And we appreciate Gulf's prompt delivery service."

On all types of construction projects, Gulf products and fine service work as a team to help contractors do a speedier, more profitable job. Let us discuss with you how they can help you on your next job. Write, wire, or phone your nearest Gulf office.



PARKWAY TUNNELS HELP MOTORISTS ESCAPE NEW HAVEN TRAFFIC TANGLE



Not long ago, a trip between New York City and New England inevitably included a bout with New Haven's heavy traffic.

Today, thanks to the West Rock Tunnels, drivers can avoid the New Haven bottleneck and enjoy the Wilbur Cross Parkway's full 29 miles. Named for a former governor, the Parkway rolls northeastward from the Housatonic River Bridge at Milford to the Berlin Turnpike at Meriden.

Estimated cost of the Wilbur Cross Parkway was \$17,500,000. Bethlehem furnished steel for the highway, bridges and tunnels.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast
Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Before the West Rock Tunnels were completed, motorists had to wind through New Haven. Above, Route 10 on Chapel Street near San Raphael Hospital, During rush periods the Parkway saves an hour's driving time.

STEEL FOR HIGHWAYS



Dowel Units * Reinforcing Bars * Guard Rail Guard Rail Posts * Wire Rope and Strand * Pipe Hollow Drill Steel * Spikes * Bolts and Nuts * Tie-Rods Timber Bridge Hardware * Sheet- and H-Piling





"Maintenance Shop A MONTHLY SOULPMENT SER

Air Power Handles Tires, **Cuts Downtime**

Pictures and information from The Goodyear Tire & Rubber Co.

HANDLING OF TIRES on large earthmoving equipment rapidly is becoming a mechanized procedure. Tire changes by power tools make each operation both quicker and safer-double profit factor.

Air power is employed in the special tools that mechanize tire handling in all possible respects. And the investment in these tools is on a "one-time" basis, whereas the cost of excess labor and unnecessary vehicle downtime due to tire changes by hand piles up day after day. Delaying one machine



HIGH-LIFT hydraulic jack with capacity of 20 tons raises heavy vehicle quickly when pneumatic power actuates it.

for one-half day for a tire change is such a large production loss on most jobs that it simply cannot be tolerated except in emergencies.

A first requisite is a big hydraulic jack, air-powered, which will raise a wheel of a large vehicle free of the ground in 1/2 min. At least 45 min would be required for

(Continued on page 156)

765 So. Ellsworth Ave. · Salem, Ohio, U. S. A.

Announcing UNIT with

To a long line of improvements in design and construction, UNIT has added another advancement — FLUID TORQUE DRIVE. This torque converter application gives the operator a steady flow of power which be can regulate with smoothness and accoracy. Elimination of shock loads adds life to bearings, shafts, gears, and cables . . . brings maintenance costs down to a minimum. Excavating work is done with a strong steady flow of power, with no "stall" and no "delay" while the engine regains speed. Crane work can be done with greater smoothness of operation by throttle control.

UNIT offers the Chrysler Torque Converter as a standard installation at no extra cost on $\frac{1}{2}$ yard machines equipped with 6 cylinder Chrysler Industrial Gasoline Engines.





SM-O-O-THER PERFORMANCE — Smoothness of operation is achieved in traveling as well as in lifting and digging. The Torque Converter in Mobile equipment allows for smooth break-away performance.



Time-saving, Cost-reducing Advantages

- Greater work output without increasing fuel consumption
- Eliminates "shock loads" on machinery, reducing maintenance cost
- Smoother and more accurate control of all operations
- Builds up line pull without excessive load on engine
- Full steady power for peak loads without stalling engine
- Quick engine pickup retains maximum line speeds
- Provides "regulated load handling" by throttle control
- Increases lugging power for hard excavating
- Engine clutch eliminated entirely
- Installation available at NO EXTRA COST

UNIT CRANE & SHOVEL CORP.

Other UNIT machines are available in V_2 and V_3 yard Excavators and Cranes up to 20 Tons . . . Crawler or Mobile Types . . . Gas or Diesel . . . Fully convertible to ALL attachments. Write for descriptive literature.



SHOYELS . DRAGLINES . CLAMSHELLS . CRANES . TRENCHOES . MAGNETS

Wins Race with Rising Water



Team of IH crawlers clears reservoir in the mountains while White River backs up behind Bull Shoals Dam

The minute they closed the new Bull Shoals Dam on Arkansas' White River, water started backing up over ground still covered with trees and brush. It had to be cleared and cleared fast, and one of the crews on the big job was Patton Construction Co.

Patton tackled the steep, overgrown slopes with 150 men and six International crawlers ranging from TD-18A's down to a TD-9. Each crawler averaged 10 acres cleared a day—"remarkable, in this rough Ozark Mountain country," says Tractor Foreman Hallie Goldsmitt.

And operator W. W. Sloane, adds, "We go up these mountainsides forwards, backwards or sideways—but we go up somehow and we get the job done because these Internationals have the power."

Ask your International Industrial Distributor today for details on the whole International line of rugged red crawlers. Ask about his service, too—and his complete stock of spare parts for any emergency. Get all the answers—and put International "Power that Pays" to work for you!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

SEE YOU AT THE POLLS!

INTERNATIONAL

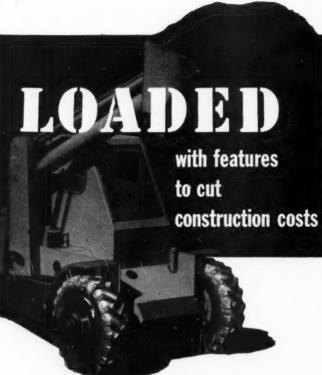
POWER THAT PAYS



UP comes another TD-18A, hitting fast and hard on a job where speed counts in beating the rising waters backing up behind the dam to create a new reservoir.



DOWN the hill goes a TD-18A, and down go the trees that stand in its way. International crawlers have what it takes, both in sheer dogged power and rugged reliability.



SCOOPMOBILE model H **FULL HYDRAULIC FRONT-END LOADER**

Handle more loads per hour... and a heaping bucketful every time... with the all-hydraulic SCOOPMOBILE engineered to cut costs and accidents on every construction job.

Bucket on powerful hydraulic arm scoops a smooth arc and automatically levels for fast cycle lift to dumping position. Tricycle chassis and power steering give maximum maneuverability. Operator in clearvision safety cab directs every operation with finger-tip controls.

Years-ahead design and rugged construction give long life and heavy-duty service.

It dozes . . . scoops . . . transports . . . backfills . . . loads all types of bulk materials.

- Standard 3/4 cu. yd. bucket scoops chassis-width track.
- Rated lifting capacity, 4,000 lbs.; standard discharge height to 8 ft.
- Heavy duty industrial engine and planetary drive axle with 3 to 1 reduction ratio gives ample reserve power.
- Can be driven at speeds to 20 m.p.h. and towed from one job to the next.
- Quick-change attachments include: Swivel type concrete hopper. Lift forks.

EXTRA-LOW IN INITIAL COST . . . EXTRA-HIGH IN EFFICIENCY

Write for literature and name of your nearest SCOOPMOBILE dealer

MIXERMOBILE DISTRIBUTORS

MIXERMOBILE . SCOOPMOBILE STATIONARY MIXERS . DUO-WAY SCOOP



LIFT TRUCKS TELESCOPIC LIFT . STATIONARY TOWER

Box 7527

Portland 20, Oregon

MAINTENANCE SHOP . . . Continued from page 152







LARGE-BORE VALVE (bottom) makes the use of "fast air" possible through fast in-flation and deflation of tires. Diameter of removable core is 21/2 times that of smallbore valve (top).

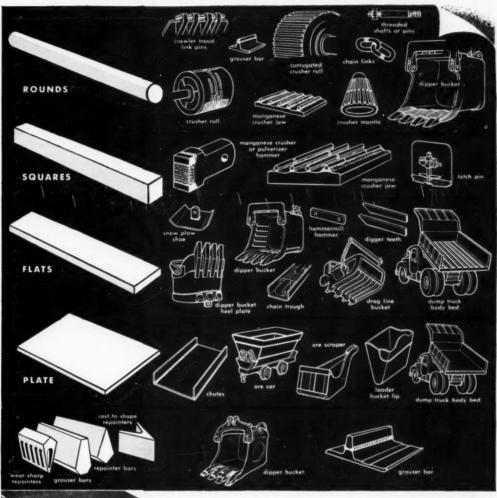
the same job with a hand-powered, short-lift jack and a set of wooden blocks

Freeing the tire from the rim to permit dismounting is done with a hydraulic tool made especially for that purpose. Tires as large as 27.00-33 can be changed in one to two hr, while up to six hours' time is required when regular hand tools are used.

Inflating large tires is a shorter job if tubes are fitted with largebore valves and the corresponding

(Continued on page 158)

AMSCO MANGANESE STEEL WELDMENTS ADD NEW LIFE TO WORN EQUIPMENT





Amsco Welding Rods and Electrodes

For repair welding of manganese steel shapes to worn equipment, American Manganese Steel Electrodes retain their toughness and give real operating savings.

Amscoating with Amsco Hard-

facing Rods increases service life ... reduces shutdowns.

Contact your Amsco Distributor or write for illustrated catalog WA-77 on Amsco Manganese Steel Weldments and Hardfacing Selector Guide.

Brake Shoe

AMERICAN MANGANESE STEEL DIVISION

385 EAST 14th STREET . CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Proven Dependability



for 100 years

Manufacturers of Pile Driving Hammers and Pile Extractors VULCAN IRON WORKS . 329 NORTH BELL AVENUE . CHICAGO 12, ILL.

When you repower....



FUNK Products include: Straight Power Take-Off Clutches Gear Reduction Take Offs Right Angle Take-Offs Front End Take-Offs Jack Shaft Extensions Ford Tractor Conversion Kit, changes

to 6 or V-8 engine, doubles the

power. Makes a Ford do things you wouldn't believe possible.



....specify FUNK Heavy - Duty CLUTCHES. TAKE-OFFS, and REDUCTION UNITS

With machinery becoming scarcer and prices getting higher, operators everywhere are finding it an economy to repower their equipment with FUNK Clutches and Reduction Units. Before your next repower job investigate FUNK Units. They are available in a wide variety to fit almost any requirement for shaft speed and installation space. Fit any standard SAE flywheel housing or Ford Industrial Engine. Write for specifications and prices.

FUNK AIRCRAFT CO.

3303 Airport Drive, Coffeyville, Kansas

MAINTENANCE SHOP . . .

Continued from page 156



TIRE TOOL is hydraulic-powered, entirely flexible in operation. It forces rim flange and tire bead back for lock ring removal.

size air chucks and tire gages are used. A 27.00-33 tire can be inflated to 50 lb in about 15 min with large-bore equipment, as compared with 30 to 45 min with small-bore valves

When tire changes involve demountable rims, the job of lug nut removal is speeded up by using the air-powered wrench. As much as 15 min difference can be made in the case of a 14.00-24-about 50% of the time required with an ordinary hand wrench.

Mechanization of tire changing requires a ready supply of compressed air. The air compressor on a complete contractor's service truck can do the job and provides the "fast air" in the volume needed to carry this important phase of every-day maintenance so necessary to keep equipment on the job.



LUG NUTS come off quickly to free the demountable rim from the wheel of a large earthmover when a pneumatic wrench does







RUN A-C POWER TOOLS

TAKE IT ANYWHERE

Look what you can do with the New Westinghouse Engine-Driven D-C Welder

Here is a lightweight, 200-ampere, gas enginedriven welder with up to 3-kw stand-by power all in the same unit. By simply plugging into convenient receptacles on the a-c power panel, the operator may obtain power for drills, grinders, pumps, lights and other electrical equipment.

LIGHT—The auxiliary generator power in this machine is gained at no penalty in weight. The 1,150 pounds represent the lightest possible engine-driven welder with stand-by power that you can buy today. The welder is rated at 200 amperes, full 60-percent duty cycle, NEMA rated, with a maximum of 250 amperes.

COMPACT—This self-contained unit is only 39½ inches from the base plane to the top of the lifting eye. Its over-all length is 62½ inches. The welding generator is self-excited and close coupled to the driving engine.

VERSATILE—This welder is valuable in construction and maintenance operations on gas and petroleum pipelines, road-building projects, railroads—in fact at any remote site where there is no access to ordinary power supply. In disaster areas, this welder can power vital electrical equipment until normal service has been restored. The standard unit is skid mounted for truck transport or may be mounted on a high-speed, pneumatictired trailer.

For more information contact your nearest Westinghouse representative, or write to the Westinghouse Electric Corporation, Welding Division, P. O. Box 868, Pittsburgh 30, Penna. Ask for Booklet B-5455. Only Westinghouse offers such EXCLUSIVE FEATURES!





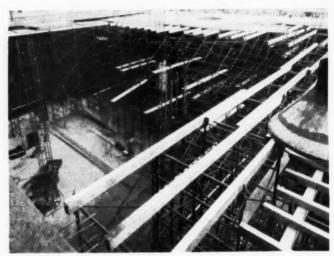
Steel Panel Scaffolding Cuts Shoring Time

STEEL PANEL SCAFFOLDING saved time and cut costs recently when used as shoring during the construction of Building No. 3 of Equitable Life Assurance Society's Gateway Center in Pittsburgh.

The basement of the building extends beyond the walls to create two areas approximately 75 ft square and from 23 to 30 ft high. These areas were to be covered with a 23-in. concrete slab, over which was to be placed 4 ft of earth fill for landscaping.

A shoring layout based on Universal Manufacturing Corp.'s Ezebilt tubular steel panel scaffolding reduced the wood required to a minimum. Sills measuring 4x6 in. rested on 30-in. centers directly on the scaffolding; 3x4 joists were placed on 18-in. centers and covered with %-in. plywood—all done in four days for each area.

The picture shows the shoring



about half completed. Ten runs 5 ft wide and spaced about 26 in. apart were used to carry forms for the slab, column caps and 8x17-in. curbs. The 23-in. slab has 28-in. supporting columns on approximately 25-ft centers with caps 7 ft

in dia. Total load on the scaffolding exceeded 300 psf, but no visible deflection showed during the pour.

The work was done by a combine of Slattery Contracting Co., New York, and the Harrison Construction Co., Pittsburgh.

GET JOBS DONE QUICKER, CHEAPER



Worthington-Ransome 31/2 cubic foot tilting mixers

NO OTHER MIXERS CAN MATCH THEM FOR:

- easy towing
- · uniform mix
- · easy handling
- long life

These sturdy members of the Worthington-Ransome Blue Brute family are as tough as they come. And a dozen features make them a joy to handle and cost-cutters for years to come. For example:

- a. no extra steps-all controls on working side
- b. low towing bail for easy towing-will not hang up on rough terrain
- c. spindle of pressed-steel bowl rides on Timken roller bearings
- d. finger-tip control of tilt lock
- e. coil-spring-mounted axle, wheels equipped with Timken tapered bearings to eliminate road shock

See your Worthington distributor for a closer look at these rugged $3\,\%\text{-S}$ tilting mixers. Write for free Bulletin to Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Construction Equipment Sales Division, Plainfield, N. J.





Bur Bue Brutes
WORTHINGTON



General contractor and technical supervisor of Standard Dry Wall Products, Inc., plan correction of an extr condition existing in bleacher seats at Braves Field,

THOROSEAL HOME RUN
at the
Braves Field



Above photograph shows THOROSEAL FOUNDATION COATING eing grouted into upper, or wearing, surface of bleacher seats.

Right photograph shows soffits of concrete seats where concrete has blistered away from reinforcing rods. Rods were sand-blasted and sealed with THORITE Patching Mortan and entire undersurface sealed with THOROSEAL.

Boston, Massachusetts.

General contractor, Henry Gironi, Allston, Massachusetts, an expert, with long experience in masonry maintenance, rehabilitation and surface protection, performs correction task on Braves Field, with satisfaction to all concerned. Waterproofing Products, Inc., Allston, Massachusetts, furnished the materials.

THORITE Patching Mortar was used for sealing rods and patching cracks and blisters in concrete. THOROSEAL FOUNDATION COATING was used for grouting wearing surfaces.

Standard Dry



ENNSYLVANIA

"HOW TO DO IT." Get our new 20-PAGE BRO-CHURE, with designer's guide. Pictorially described, in detail

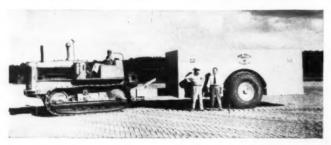




King of the Heavyweightsthe 50 ton BROS ROLL-O-PACTOR

Have you seen a giant rubbertired Roll-O-Pactor in action? If not, you should see how its extra large wheels and tires put "super load compaction" on deep, soft lifts up to 24 inches . . . how Bros Rocking Beams keep tires squarely in contact with uneven ground, riding slopes

as high as 19°. Tested over a variety of actual job conditions, the Roll-O-Pactor has been more widely approved than any other compactor! And it is solidly backed by the complete Bros service organization. 35 and 50 ton models. You can vary rolling weight to suit jobs.



The Wright Construction Company of Columbus, Georgia used a Model 450 Bros Roll-O-Pactor with 70 lb. tire pressure and 40 ton roller weight to compact a 118 lb. per cubic foot sub-grade to 98-100.2% of required density in one pass. After placement of 8 inch base material, they got 100% required density on the base and 98 to 100% as deep as 24 inches in the sub-grade in three passes.



WRITE FOR NEW CATALOG

Get your free copy of this big new catalog filled with results of soil tests, equipment comparisons and actual job histories. No construction man who is concerned with compaction should be without it! Write for your

S BOILER & MFG. CO. ROAD MACHINERY DIVISION . MINNEAPOLIS 14, MINNESOTA

World's Largest Manufacturers of Pneumatic-Tired Rollers

On-the-Job Contractor-Labor Relations

by LEON B. KROMER, JR.

The Stabilization Picture Clears

THE A.F. OF L. and the C.I.O. have agreed to go along with the reconstituted Wage Stabilization Board. The labor members from the old board have been appointed to the new which began operation on August 1 and inherited the backlog of cases, regulations and orders (except that dealing with farm labor) from the old board.

The Construction Industry Stabilization Commission continues to function with little evidence of change under the new control law. However, it has lost a public member-its co-chairman, Archibald Cox, was elevated to chairman of the new WSB-and gained an alternate industry member (see below). Also, voluntary disputes in the construction industry can no longer be referred to CISC by its parent, the WSB, as all dispute settling was taken from the board by Congress.

In the past, WSB had referred disputes voluntarily submitted by contractors and unions to CISC for arbitration or recommendations. Now, if you get into a dispute with unions that can't be ironed out by usual negotiations, you can utilize state or federal mediation serv-

No Picketing Over **Jurisdictional Disputes**

Building trades unions that picket your job over jurisdictional disputes may face severe disciplinary action from their internationals. Any local building trades council that supports such picketing may have its charter revoked by the AFL Building Trades Department.

These measures are contained in a recent policy resolution unanimously adopted by the 19 presidents of the international unions of the Building Trades Department. The declaration forbids picketing over jurisdictional disputes. Should pickets be posted

at a job site, other unions are directed to ignore it pending disciplinary action against the union that posted the picket line.

This is another step taken by leaders of building trades unions to eliminate one of the industry's worst and most costly problems. The 19 international presidents are preparing a further statement on contractor cooperation in overcoming jurisdictional disputes by correct work assignments. When released, it will be reported in this column as a guide for you.

Exemptions...NotMany

Exemptions as provided under the new law are being interpreted by the Director of Economic Stabilization and Office of Salary Stabilization. The new regulation on exemption of professional engineers has already come out (see August CM&E) and now ECA has issued its order clarifying the "eight or less" employees exemption.

Under this order contractors' employees are not, as was to be expected, exempt. So, contractors, regardless of the number of employees they have, must still comply with all wage controls. Don't let this confuse you with the blanket exemption for employees receiving less than \$1 (who may be moved up to that rate without receiving any approval) and professional engineers.

Relief for Home Builders

Home-building contractors, long plagued with special problems under wage regulations, will now have their own representative on CISC. Joseph H. Vatterott, chairman of NAHB's Employee-Employer Relations Committee, has been appointed an alternate industry member. For you home builders, he is your spokesman in the stabilization setup, and your problems should be directed to him at CISC headquarters in Washington

Home builders won another victory in their long fight over wage regulations. In its closing days the old WSB recommended to the new board that it amend CISC Regulation 1 to permit continuation of certain premium, bonus and piece work rates under certain conditions. When the regulation amendment is issued it will be reported to you in this column.

(Continued on next page)



J-M Industrial Friction Materials are the No. 1 choice of most leading manufacturers of earth-moving equipment

Friction materials are so vital to smooth and satisfactory machine performance that most manufacturers choose them with utmost care.

They look for the *correct* combination of operating characteristics and maximum wear. That is why the majority of manufacturers of earth-moving equipment find exactly what they need in Johns-Manville Industrial Friction Materials.

Time and again, J-M Industrial Friction Materials have set records for endurance and low-cost operation. That's not surprising, for J-M friction products are engineered for the job. Whether in block, lining, facing or cone form, they are formulated for maximum service life and top performance.

When it's time to replace clutch and brake friction materials on your own machines, take a tip from the manufacturers and specify Johns-Manville. In that way you can be sure that your equipment will continue to give the excellent service the maker built into it.

Write for your copy of "Johns-Manville Industrial Friction Materials" FM-12A. It contains a wealth of important application and performance data. Address: Johns-Manville, Box 60, New York 16, N. Y.

Johns-Manville INDUSTRIAL FRICTION MATERIALS No. 1 With Leading Manufacturers

WISCONSIN-Powered Joint Cleaner Helps Prepare WRINKLE-FREE Runways





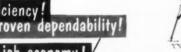
Powered by a 13 hp. Model TF 2-cylinder Wisconsin Heavy-Duty Air-Cooled Engine, this Model "G" Tennant joint cleaner, manufactured by the G. H. Tennant Co., Minneapolis, Minn., prepares airport pavement joints for re-sealing. The machine routs out shrunken old seal, pebbles and dirt, refacing side-walls at the same time.

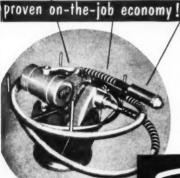
Helping to prepare smooth, "wrinkle-free" runways is another typical power service application in which Wisconsin Air-Cooled Engines fit both the machine and the job.

You can't do better than to specify "Wisconsin" for any purpose that requires dependable engine power within a 3 to 30 hp. range.









Thousands of STOW vibrators the country over are proving their value every day . . proving their efficiency by making possible quick, perfect placement of stiff mixes . . . proving their dependability by working hour after hour, day after day under the most rugged conditions without time-losing breakdowns, without expensive maintenance.

GASOLINE AND **VIBRATORS**



Write today or see your local distributor for a copy of STOW BULLETIN 511 and complete details on STOW concrete vibrators and screeds.

STOW MANUFACTURING CO. 31 Shear St., Binghamton, N. Y.

LABOR . . . Continued

Do You Know That . . .

Under WSB and Salary Board regulations you must file wage and salary schedules before starting new jobs in areas where you have not previously performed work? This applies to all on-site employees except the building trades laborers and mechanics.

The Office of Salary Stabilization is launching a nationwide drive to enforce compliance with stabilization regulations? This was announced by OSS General Counsel who indicated his agency is getting assistance from Internal Revenue and the Justice Departments. So far tax disallowances of over \$53,000 have been imposed.

Juggled Entry

IN THE LISTING of operating and maintenance manuals with parts lists for Galion rollers, on page 75 of the Equipment Maintenance Directory published in July, several of the rollers are listed with the wrong manual numbers.

The correct listing is:

Roller	Manual Number
Chief	TM5-1100 & 1100A
Warrier	2013
10 to 14-ton Tand	dem 744
10 to 14-ton Tand	dem 2019
8 to 12-ton Tane	dem 744
8 to 12-ton Tan	dem 2019
5 to 8-ton Tand	em 944
5 to 8-ton Tand	em 2014
3 to 5-ton Tand	em 2005
3 to 5-ton Tand	em 2022
Portable	2005
Portable	2023
Trench	2022

And remember to give model and serial numbers in each case when writing for information.

Missing Entry

The B. F. Goodrich Co. listing on page 90 of the Equipment Maintenance Directory should include the following literature:

Manual No. 1-9984-GP: Safety First in Tire Service; also wall chart.

Manual No. 1-9723-GP; Truck Tire Load and Inflation Table; also wall

Manual No. 1-7816-GP: Nine Ways to Get More Miles Out of Your Truck

Manual No. 2-7909-GP: Industrial Tire Guidebook for Users of Ma-terials Handling Equipment.

Instruction books on off-the-road tires; highway truck tires; and in-dustrial tires.

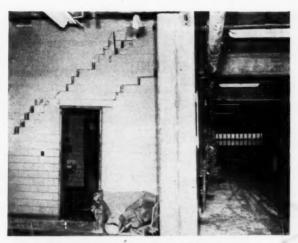
Monotubes put "crippled" building back on its feet!

DOING unusual foundation jobs, even with low headroom, is often the usual task for Monotube steel piles. For example, the building pictured here became badly cracked due to differential settlement. The condition had to be corrected—permanently!

Providing proper underpinning and licking the low headroom problem was easy with Monotube piles. Short, 6-foot lengths were driven easily; extensions were quickly weld-spliced as needed to reach good soil at 65 to 70 foot depths.

Monotubes have advantages that help solve problems in all kinds of foundation construction—from turnpikes, bridges and skyscrapers, to jobs like the one pictured here. Monotubes, cold-rolled for high strength, offer exceptional rigidity and high structural value. They come in lengths, gauges, tapers and sizes for varying soil conditions.

Send for the complete story. Find out how Monotube steel piles can simplify foundation work and cure construction "headaches", at minimum cost and in minimum time. Write to The Union Metal Manufacturing Company, Canton 5, Ohio.



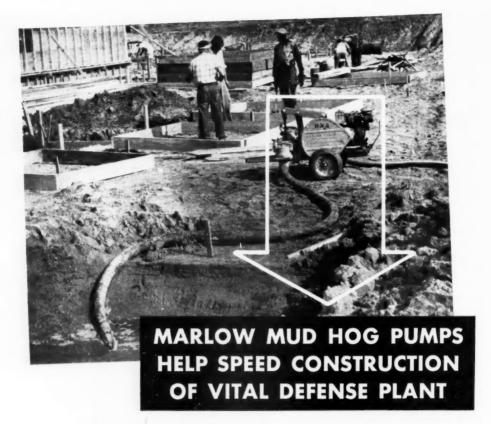
Severe cracking of building wall due to differential settlement.



Close-up of Monotube pile being driven in 6-foot sections. Installation by The Purdy Construction Company, Mansfield, Obio.

UNION METAL

Monotube Foundation Piles



When Darin & Armstrong, Inc., general contractors, wanted "dry digging" insurance on a highly important defense plant construction job, they chose multiple units of Marlow Mud Hog Pumps, supplied by Michigan Tractor and Machinery Co. of Detroit as distributors.

"We use Marlow Pumps," says Mr. Duncan Cain, Equipment Superintendent of Darin & Armstrong, "because we have found them extremely satisfactory for our type of work."

Construction men all over America and all over the world know the simple.

rugged and trouble-free construction of Marlow Mud Hogs. These famous time-tested pumps will handle mud, sand, slime and solids in suspension with ease and speed, sucking up muck almost thick enough to shovel.

The Mud Hog's patented ball valves are virtually clogproof. All liquids pass under the diaphragm to avoid unnecessary wear and cutting hazards.

When messy digging confronts you, Marlow Mud Hogs will work fast and dependably to make the job easier. Write for new free bulletin No. C-52.

MARLOW PUMPS RIDGEWOOD,

Manufacturers of the World's Largest Line of Contractors' Pumps Including the Famous Marlow Mud Hogs

They Say...

Construction men shared the limelight early this month at the Centennial of Engineering in Chicago, a huge conclave celebrating the 100th anniversary of the founding of the American Society of Civil Engineers. Below are excepts from a few papers presented.

"Despite the many important improvements in mechanization in recent years, contractors are seeking additional progress that they feel is necessary. Included are more flexible equipment, more refinements in equipment, higher speed in machines, equipment that is easier on the operator, units that can produce for longer periods without shutdowns for repair or maintenance, lighter-weight machines, units requiring fewer operators, greater ease in maintenance and repair of equipment and greater standardization of parts." -A. N. Carter, Manager, Highway Division, Associated General Contractors of America, Washington, DC

"This is a good time for the civil engineer to enter the construction field. . . . The skilled training of the engineer has won the respect of general contractors. . . educators now are recognizing that the construction industry is a field of opportunity for engineers. There seems to be more emphasis on construction courses in technical schools."—Dwight W. Winkelman, President, D. W. Winkelman Co., Syracuse, N. Y.

"We are acquiring the ability to rebuild the earth and the question arises: How do we want to rebuild it in order to make it a better place to live? If we restore our wasted soil, conserve forests, purify waters and eliminate slums, we shall be on the right path."—Francis Donaldson, Vice President, Mason & Hanger, Inc., New York.

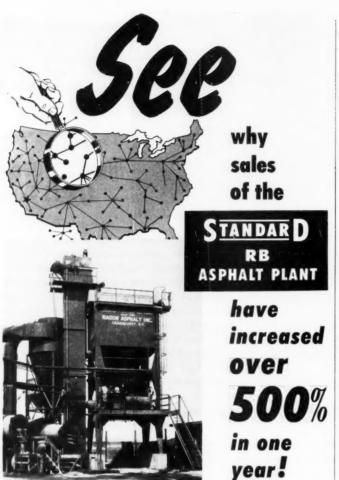
"Modern construction has taken the backbreaking toil out of manual labor. It has substituted manual skill for sweat. It has given construction workers mechanical aids so that they might better use their talents for greater and more economical production. It has kept the cost of construction down to within the ability of the owners, both public and private, to buy construction services."—Harold W. Richardson, Editor, Construction Methods and Equipment, New York.



4500 ONE AND THREE-

QUARTER TON BLOWS PER MINUTE are supplied by the JACKSON Vibratory Compactor. It propels itself and is extremely easy to move from place to place by means of a quick pick-up trailer unit on which the power plant, from which it operates, is mounted. On numerous jobs, such as compacting asphalt in highway patching and widening, paving walks, drives, railway platforms and crossings, or in compacting granular soils for concrete floor sub-bases, in trenches, close to footings and abutments, there is nothing that approaches it in time and money-saving ability; and no equipment, regardless of size or cost, does a more thorough job. It will compact 900 to 1200 sq. ft. of asphalt per hour very close to the maximum density of the mix used. In granular soils, two quickly made passes produce maximum density to a depth of 12 inches. See it at your Jackson Distributor, who has it both for sale and for rent, or write for complete details.





Take a close look at the pattern of Standard RB Asphalt Plant installations. You'll notice when one RB plant starts operating in a locality, others soon follow. That explains why STANDARD sales have zoomed over 500% in a year. The word is passed from contractor to contractor—"HERE'S THE SWEETEST PERFORMING PLANT IN AMERICA—a bearcat for economy, ruggedness and high capacity."

But the best way to SEE the reason for the RB's popularity is to watch the plant in action. Balanced flow is the secret—assured by such features as extra-large dryer capacity and oversize elevators, vibrating screens and air handling systems. There are no stops—no bottlenecks. Write today for the address of the Standard Plant nearest you and—SEE FOR YOURSELF.





End-Welded Studs Salvage Track Bolts

END-WELDED STUDS recently were used effectively to salvage the sound portion of hold-down bolts on pier railroad tracks which had corroded badly at their thread ends.

Contractor Charles F. Vachris, Inc., Brooklyn, N. Y., and Navy engineers hit upon the idea during the reconditioning of pier facilities of the U. S. Naval Ammunition Depot at Earle, N. J. The worn tracks were to be replaced with heavy rail.

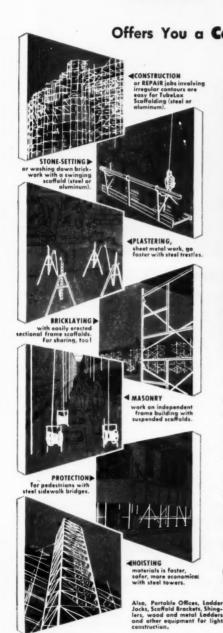
The old track was secured to the concrete piers by long bolts with their heads embedded in the concrete. Chipping out and replacing corroded bolts meant a long and expensive operation.

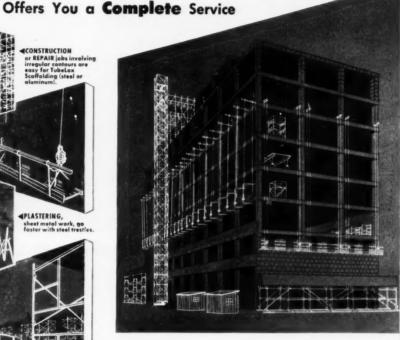
Instead, the rails were stripped and pneumatic chip hammers used to remove existing grout. Bolts were cut off to sound metal by acetylene torches. Then threaded 34-in. Nelson studs, 3½ in. long, were end-welded to the bolt stubs with a semi-automatic Nelson stud-welding gun.

Double porcelain ferrules were used to align the bolts and granular flux-filled studs and provide the necessary shielding while the butt welds were made. Navy tests show that the welds produced take an 18- to 19,000-lb tensile load before breaking.



REMEMBER THE PATENT SCAFFOLDING CO.





WE stock, rent and sell all types of fixed and rolling scaffolds for construction, repairs, remodeling and all types of sub-contract work. This means you get the right scaffold for your job from one source of supply . . . a convenience no other manufacturer can offer.

And, our many years of experience in the scaffolding industry will help you cut costs—while doing the job better. You'll save time and money by calling us when you need scaffolding.

P. S.—Patent Scaffolding—Whatever your job.



38-21 12th Street, Dept. CM&E, Long Island City 1, N. Y. West Coast Plant: 6931 Stanford Ave., Los Angeles 1, Calif.

CONSTRUCTION EQUIPMENT NEWS . . A Preview of

JAMES M. CONNOLLY, Equipment Editor



Scoop Shovel Attachment Fits Front End of TL-25

Shown working here in an underground lead mine in Oklahoma is the new Scoop Shovel that's interchangeable on any full-revolving TL-25 turntable with clamshell, hoe and dragline attachments, etc. A 1¼-yd dipper is fastened to a double dipper stick that's crowded in and out telescopically through dipper-stick sleeves fastened to the outer end of the boom. Depending on boom position, the scoop can load in level, up or down direction. When horizontal, it will move through a stroke of 6 to

7 ft. A 3-part hoist line raises the entire front end for dumping, which is accomplished by the operator nudging a convenient lever next to his elbow. While its action is essentially for horizontal skimming, the bucket can be jabbed straight into the material, lifted vertically through it, or both actions handled simultaneously. It can make three to four passes per min, swinging material from face to trucks and can work in 10 ft 6-in. headroom.—Thew Shovel Co., Lorain, Ohio.



Heavy-Duty Chassis For Off-Highway Use

The rigidity and stamina of the new Sterling-White heavy-duty chassis is amply displayed here as the front wheels are lifted off the ground while the huge drill rig is hauled aboard. Labeled Model SB 3255D, it was originally developed for oil field operations but variations are also available for logging and other off-the-road operations. Powered by a 200-hp diesel, it has dual transmissions: a four-speed main and three-speed auxiliary that give a wide selection of gear ratios. Top speed is 42 mph in overdrive and with both transmissions in low gear, the total reduction is more than 120 to 1. Road speed at that point is 2.5 mph with engine run

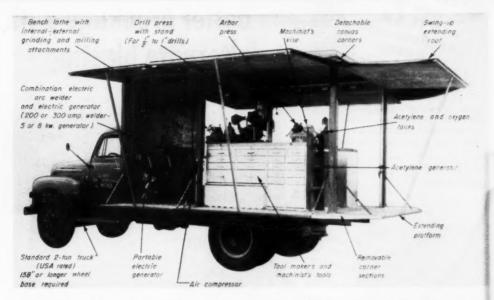
ning full. The dual rear axle has a suspension system with equalizer beams mounted below the rear springs. This provides equal load distribution over holes, ruts and other irregularities. These beams and the torque rod system absorb most strains and shocks before they can reach the springs. Steering is hydraulic power actuated.—Sterling Div., The White Motor Co., Milwaukee 1, Wis.



Covered Dumpcrete Can Haul Bulk Cement

A steel cover with a loading hatch can now be had to put over a Dumperete body in order to transport bulk cement. Contractors have found the non-agitating hauler to be fast, economical and efficient, according to the

New Machinery, Tools and Equipment That Will Help You on the Job



Mobile Machine Shop Is a "Traveling Troubleshooter"

When Cemco Industries, Inc., set out to design their traveling machine shops, they had three prime requirements in mind: (1) the rig must be complete—within reason; (2) it must have everything conveniently arranged and compact; and (3) only recognized, quality equipment would be accommodated. Now it's available, and can be mounted on any standard 2-ton truck (USA-rated) or in a trailer or van-type vehicle. Its generator is removable for use anywhere on the job. Power can

be supplied for a stationary generator, are welder or similar piece of equipment by a CEMCO split-shaft power takeoff driven by the truck motor. Power can be supplied to a generator, for instance, or to the rear axle, but not to both at once. An automatic speed control governs engine speed to meet varying power needs and full power of the truck motor can be transmitted through any forward or reverse speed of the transmission.— Cemco Industries, Inc., Galion, Ohio.

manufacturer, especially for the haul between railroad sidings and batching and mixing plants. The cover is easily removed to revert back to transfer of concrete, sand, crushed stone, gravel, etc. They're currently being used by Texas Construction Co. on the installation of a spillway at Lavon Dam in Texas; Lytle-Amis Construction Co. on Medicine Creek Dam in Nebraska; and many others. Bulk cement capacities for the Dumpcrete models 2C, 3C and 4C are 4.1, 5.7 and 7.2 cu yd respectively (25, 34 and 43 bbl).—Maxon Construction Co., Inc., 131 N. Ludlow St., Dayton 2, Ohio.

Spread-Mobile Has Ice-Control Features

If you look closely at the accompanying illustration you'll see the distributor plate on this Spread-Mobile beneath the forward end of the body, slightly behind the driver's seat. This permits spreading of sand or other skid-proofing materials in front of the rear wheels, asuring better traction for the truck. Another vital feature is the self-heating system which prevents the freezing not only of the lower part of the load, but also of the conveying and spreading mechanism as well. No cost is involved here, since the heat is provided by piping the exhaust that runs through the entire length of the body and surrounds the lower part of the conveyor. The



driver fully controls all operations from the cab, including the conveyor, spreader and deflecting baffle which deflects the material from the wheels of passing cars or the legs of pedestrians. Bodies come in 9, 11- and 13-ft lengths with a 20½-cu ft per ft water-level capacity.

—Baughman Mfg. Co., Jerseyville, III.

Domor Road Widener Joins "Cat" Attachment Line

There'll be no extra concrete poured during this roadwidening job because the new Domor Road Widener, fastened to the "Cat" grader blade, leaves a clean, compact and level surface. After two regular blade cuts to (Continued on page 173)



Ripple reveals key to better breakage with alternate blasting

All ready for a blast at North Jersey Quarry Company's Millington, New Jersey operation. ROCKMASTER[®] milli-second delay detonators Nos. 2 and 3 are in alternate holes to be fired from the *bottom*.



Here is the peak of the blast. Note
the "ripple" indicated by the
curved lines — a graphic demonstration of alternate milli-second
blasting at work on rock. First
delays put the rock under stress;
delays put the rock under stress;
then, later delays throw in their
punch at the instant of maximum stress.



And, here is the rock pile ready for the shovel. Rock is practically all "bite-size" and well distributed—visible evidence that with Rockmaster milli-second delays blasters can utilize more of the available explosives energy to break rock and pile it to the proper height.





ROCKMANTER Blasting is controlled blasting. See how it can work for you. Send for the free 16-page book, Quarry Blasting the ROCKMANTER Way, illustrating milli-second delay methods with machinegun photos.

ATLAS EXPLOSIVES

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE
Offices in principal cities



remove excess dirt, two more with the widener produces a trench that needs no hand trimming and leaves the paving edge clean for a good bond. Mounting of the frame and roller device takes only a few minutes and operation, through the grader controls, meets exacting specifications. Rollers guide the plowlike blade along the edge and lip of paving, and as the trench is cut the cutting edge scours the edge of the paving. It's available only after thorough testing on Illinois road projects. Further information can be had from any Caterpillar dealer or from the manufacturer, Ulrich Products Corp., Roanoke, Ill.



AIR-OPERATED HOISTER-With a simple turn of an air valve, the mechanic shown here was able to lift an automobile 50 in.! Now it's a stand-up job to replace an exhaust pipe, adjust shock absorbers, pack wheel bearings or perform hundreds of jobs which heretofore required either a full-size lift or uncomfort-able on-your-back work. The Homestead Hoister pictured is No. 5 model, a big sister to the other model No. 3. It measures only 34x70x331/4 in., weighs 550 lb and lifts 5,500 lb through ten positions to a full 50-in. lift. The smaller model measures 30x67x281/2 in., weighs 315 lb and

ELTA Leads Again

WITH THE FIRST MAJOR IMPROVEMENT IN RADIAL SAW DESIGN -

the DELTA 16" Radial Saw

Completely new, the Delta 16" Radial Saw is the most practical radial saw on the market today, giving you easier and safer performance on every operation you

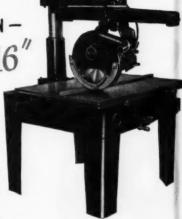
Only the Delta gives you a saw blade that stays above the work table on a full 360° arm swing, to cut miters from 0 to 90° right or left, with normal "pull saw"

Enclosed "lifetime" trackways are glass-smooth. Hardened surfaces minimize roller friction, carriage travels more easily.

Quick-set stops at 30°, 45°, 60° and 90° speed operation.

Compare These Exclusive Features:

- * Only Saw With All Controls In Front —safer, easier to operate because every lock, lever, crank and cali-brated scale is "up front".
- * 16" Saw Blade Cuts 51/2" Deep-unmatched capacity, more than any other 16" radial saw blade—blade not only cuts deeper but lasts longer.
- * One-Piece Aluminum Safety Guard -covers the entire saw spindle for added safety—can be fitted to enclose blade completely.
- ★ Sensational New "Lo-Rise" Motor— powerful direct drive, totally fan-cooled motor furnished in 3, 5 and 71/2 HP.
- ★ Front Guide Fence Controls—offer quick, positive locking action when changing guide fence positions; no more hammering of wedges.



DELTA POWER TOOLS Another Product

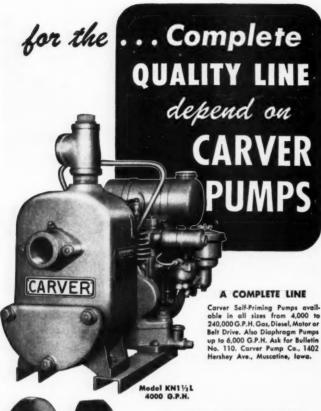
There's a Detta Pewer Tool for your Job. WOOD OR METAL WORKING

53 MACHINES 246 MODELS MORE THAN 1300 ACCESSORIES

MANUFACTURING COMPANY

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- ☐ Please send me the name of the nearest Delta

Company_



A QUALITY LINE

Quality is our strong forte - Every Carver Contractor Pump is designed and manufactured with one specific purpose in mindto provide you with rugged dependable equipment, loaded with reserve power and stamina, to handle the toughest construction jobs. Nothing fragile about these pumps; no skimping on materials; no underpowering; no compromise of quality. Throughout their many years Carver pumps have earned an enviable reputation in the field for dependable, efficient and long-life service. We shall continue to build pumps that will perpetuate this reputation.

Specify Carver Contractor Pumps your best buy for better performance.

eventually occurs you don't replace the entire costly casing, as in ordinary pumps. Simply remove and install a new liner, a new impeller if necessary, and pump efficiency is restored at Another Carver Quality Feature!

REPLACEABLE LINERS

AND IMPELLERS

Sturdy, wear-resistant replaceable liners

and impellers are standard equipment in

all Carver Contractor Pumps. When wear

CARVER

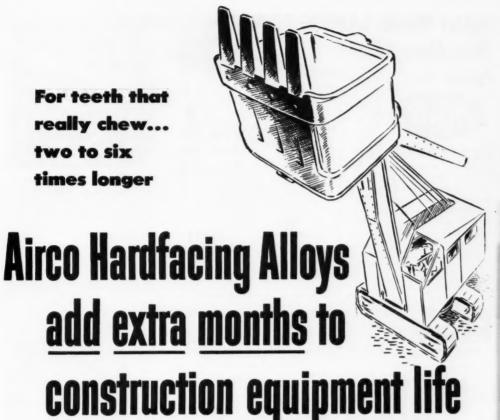
can lift 3,000 lb through a full 53 in. In trials the Lifters have saved as much as 50% of the mechanic's time by raising each job to the most convenient height. It is fully portable and can be used outdoors or on upper floors. The only requirement is an air hose with at least 80-psi pressure, although best pressure is 120 psi. Exhaust ports prevent piston over-travel, and a safety lock can hold the load at any one of the ten working heights. Upended storage space needed when not in use is only 30 in. square. The Lifters can handle trucks, front or rear, with equal ease.-Homestead Valve Mfg. Co., Hypressure Jenny Div., P. O. Box 31, Coraopolis, Pa.



"CIRC-L-SCALE" OFFERED FREE -The new, useful device shown here has been approved by the American Society of Industrial Engineers and is a combination compass, scale, square, protractor and lettering guide. It is small, handy and durable; made of Vinylite plastic because of its low coefficient of expansion. On the reverse side are a temperature conversion table, list of decimal equivalents, tap and drill scale and a metric rule. It's offered free by Unistrut Products Co., Dept. M, 1013 W. Washington Blvd., Chicago 7, Ill.

HYDRAULIC HIGH-LIFT BUCKET FOR AGRICAT-Just a year ago we announced the latest attachment for the midget Agricat (6 ft long) tractor as a rotary broom. This year it's a hydraulically controlled frontend bucket with a high lift and 5-ft capacity. A Vickers 1,000-psi pump feeds two rams whose pushing capacity is 491 lb and pulling capacity 368 lb per 100 lb of pressure. Bucket height travel is from 4 in. below track level to 72 in. above ground. Used with suitable attachments the (Continued on page 176)

For teeth that really chew... two to six times longer



Today worn machinery and equipment mean more than replacement costs. Demands of the present industrial situation may require more priority than you're in a position to give.

Many foresighted construction men are hedging their worn equipment problem by insuring longer life for their present machines through the use of Airco Hardfacing Alloys . . . adding months to equipment life - and in many cases, improving the operating characteristics.

Bucket teeth are a good example. One firm found

hardfacing manganese bucket teeth added two to six months working life to these formerly 'expendable' items.

But this is only one Airco Hardfacing Alloy application you can use to save time, money, and equipment. Your nearest Airco Office will gladly show you how these cost-conscious Airco Alloys will help you with your particular problem. Write today.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND





AND OFFICES IN PRINCIPAL CITIES

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DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

September 1952 - CONSTRUCTION Methods and Equipment - Page 175





For joining grader, trencher, ditcher and other earth moving conveyor belts.

For belts \%" to \1/2" thick.

A FLEXCO fastener that is HINGED. Has removable hinge pin.

Troughs naturally, operates through take-up pulleys.

7704 S. Chicago Aveni Chicago 19, Illinois

Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, III.

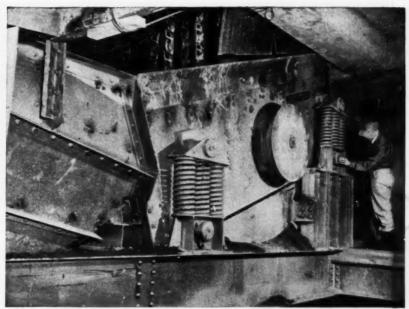


(Continued from page 174)

small machine has proved its worth on such diverse jobs as leveling, landscaping, snow removing, plowing, harrowing. With the new highlift bucket it will be able to do light excavation work as well. Manufacturer is Earl H. Pence & Co., Inc., 2150 Washington Ave., San Leandro, Calif.



TRUCK BODIES AND HOISTS-A complete new line of hydraulic dumptruck bodies and body hoists, featuring many outstanding features, is announced by St. Paul Hydraulic Hoist, subsidiary of Gar Wood Industries. Claiming up to 22% more payload than previous models, they're available in a selection of 14 capacities from 6 to 25 tons. A unique stress-eliminating design feature is said to absorb almost all dumping shocks, and permits use of a new principle in hoist design-a flexible sub-frame which ends tendency of rigid hoists to crack or bend when flexed. New contractor's type bodies were released as matching units for the hoists which are said to have the industry's lowest standard mounting height, advanced lifting point and new low-operating oil pressures.-St. Paul Hydraulic Hoist, Wayne, Mich.



Impervious material for the dam core is first scalped on this 6' x 14' Hewitt-Robins Heavy-Duty Scalper equipped with 12" x 15" openings in the steel deck.

Hewitt-Robins System Processes 7 Million Yards of Material for Huge Earth-Filled Dam

To maintain a fast, continuous flow of this mountain of material at the lowest cost per yard, the contractors of a huge Eastern dam project are using a unique materials processing system designed by Hewitt-Robins.

This system, consisting of Hewitt-Robins Heavy-Duty Scalpers, Belt and Pan Conveyors, is divided into two self-contained processing plants. One plant is handling approximately 2 million yards of impervious earth for the dam core . . . the other is processing some 5 million yards of pervious material. These plants are designed to operate at the rate of 1300 cubic yards and 2600 cubic yards per hour respec-

tively and to operate 20 hours a day, 5 days per week.

Here is just one more example of how Hewitt-Robins bulk materials processing and handling systems are meeting schedules and cutting costs for contractors everywhere.

Learn how a Hewitt-Robins system may provide a more efficient—more dependable—more economical answer to your bulk materials handling and processing operations. Let us show you facts and figures. Send us details of any project you now have or intend to bid on. Include topographical maps. Write Contractors' Service Department, Robins Conveyors Division.

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PORTABLE 150-TON COMPRES-SION UNIT-To meet the demand of compression testing of standard 6x2-in, and 8x16-in, concrete cylinder specimens on the job, a compact, portable unit is now available. A specimen is placed between two compression surfaces; the upper one is self-aligning to assure accuracy. A hand piston pump supplies the pressure with loads indicated on a gage with maximum load pointer. The standard gage indicates loads from 30,000 to 300,000 lb, but a metric scale is optional. Accuracy is checked prior to shipment.— Tinius Olsen Testing Machine Co., 1184 Easton Rd., Willow Grove, Pa.

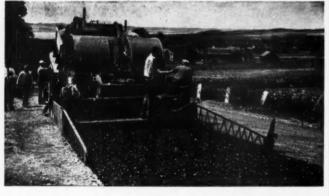
EXPANDED METAL WALKWAYS

There are literally hundreds of occasions on construction jobs when
sure footing is absolutely necessary.
Danger of slipping near machinery
or plant installations has been
lessened considerably by use of SafeTMosh walkness and exist treads.

Danger of slipping near machinery or plant installations has been lessened considerably by use of Safe-T-Mesh walkways and stair treads. Made by slitting and stretching heavy gage steel into non-skid, diamond-patterned surfaces, th Safe-T-Mesh is welded to sturdy angle-iron frames. In the photo at right, these walkways and treads are apparent on a Cedarapids bituminous mixing plant that's producing 110 tons of hot bituminous correcte per hr for resurfacing of the Lincoln Highway.



Advantages are high strength-weight ratio, weather resistance, through-visibility, etc. The skidproof surface prevents slipping or falling, according to the manufacturer, and the open work pattern allows passage of dirt, dust and water that otherwise would accumulate and make walking surfaces slippery and dangerous.—Wheeling Corrugating Co., Wheeling, W. Va.



Cut Resurfacing Costs with the Moto-Paver

Moto-Paver mixes and lays a high quality bituminous mat in one continuous operation, giving a smooth, waveless surface even when resurfacing over rough, irregular pavement. Because of the savings effected in both time and labor, resurfacing costs are substantially reduced.

Moto-Paver uses beach sand, gravel, crushed stone or slag aggregates and various bituminous materials including tars, cutback asphalts, road oils and emulsions with equal efficiency. A uniform mix is assured.

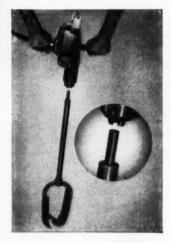
Standard and heavy duty models for handling all types of resurfacing, retread and stabilization jobs under all kinds of operating conditions. See your local H & B distributor or write for Bulletin MP-49.

HETHERINGTON & BERNER INC.

735 Kentucky Avenue

Indianapolis 7, Indiana





"HOLE - A - MINUTE" DIGGER — Here's an economical new device to offset the expensive and tedious task of digging post holes. It was devised by a contractor—for use by contractors—and operates with any electric drill of ½-in. size or larger. It's said to literally live up to its name and drill a hole a minute in hard or soft soil. Machined from a bar of extra tough, case hardened alloy steel that has been heat-treated, it's fully guaranteed by the maker.—Hole-A-Minute Div., Eugene John Freeman & Co., P. O. Box 2143, Van Nuys,



This two-drill jumbo, mounted on a crawler chassis, collars and bottoms breast holes with one 10-ft rod of hollow drill steel. Drifters are mounted on 11-ft sashes incorporating an air-powered chain feed.

Crawler jumbos speed drilling at Eagle-Picher



This mobile unit is typical of Eagle-Picher ingenuity. The giraffe-like jumbo has a 35-ft telescoping mast for taking down roof. Another model has a 65-ft mast. Holes are started with a 12-ft steel and finished with a 20-ft length.

Photos courtesy of S. S. Clarke, General Superintendent of Mines, Eagle-Picher Mining & Smelting Co., Cardin, Okla.

Traditionally a leader in the development of new mining methods, Eagle-Picher Mining & Smelting Company is one of about thirty mine-mill operators in the famed Tri-State zinc-lead district. The massive, flat-lying ore bodies of this region have contributed heavily to the nation's stockpile of metals in two world wars.

Eagle-Picher, now operating 19 mines, has made a number of outstanding contributions to drilling technique. An example is the crawler-propelled jumbo, mounting two or three drifters, which cuts down drill set-up time and operator fatigue. The 11-ft sashes make it possible to collar and bottom breast holes using only one 10-ft rod of hollow drill steel. Two lengths of steel are used for stoping a hole 14 to 16 ft in depth. Safe and easy to operate, these jumbos have greatly reduced drilling costs and increased tonnage.

Like so many leading mines, Eagle-Picher uses large quantities of Bethlehem Hollow Drill Steel, both our standard carbon and alloy grades, in their operations.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL ST







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Only proper screening and washing can cut costs and that is where RELIANCE EQUIPMENT makes its reputation. These Units have been greatly improved in the past few years and today many regard Reliance as standard for best results. Let us tell you more about their smooth operation and rugged construction. Write for Catalog 48.

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RELIANCE PRODUCTS still available at moderate cost

Ack Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxe



SWEDISH-MADE VERNIER CALI-PER-Toolmakers, inspectors and others who demand accurate measurements will be interested in this model, made by Eskilstuna Tools of Sweden and now available in the U. S. The caliper is capable of measuring external, internal and depth dimensions, including core diameters of threads in fractions or decimals of inches. Jaws are lapped parallel. Tests with the Johanssen plug gage have shown the calipers to be accurate, as claimed. The fitted side has a friction lock. Six inches long, its jaws are 19/16 in. deep and over-all dimensions are 3x8 in. It's sold in this country through Master Rule Mfg. Co., 40 Mulberry St., Middletown, N. Y.

FABRIC-REINFORCED ABRASIVE BLADES-A new masonry blade, reinforced internally with layers of strong fabric, and protected by a safety web molded into its surface, can handle difficult edge cuts, grooving cuts, and grinding-type cuts impossible with standard-type abrasive blades. The new Eveready "TUFFIE" reinforced masonry blade is said to be virtually indestructible, because of its ability to withstand twisting strains and binds. It can be used on any make masonry or hand-power saw, and cutting life is said to be two to three times longer than that of the standard-type abrasive blade on the softer ranges of material. The TUFFIE is specially suited to the cutting of concrete block, cinder block, most common brick and the softer ranges of stone. Blade sizes range from 12to 18-in. dia for masonry saws and 6- to 8-in, dia for hand-power saws. Because of its extreme toughness, it is not recommended for cutting the very hard vitreous materials such as glazed tile, acid-proof brick, terra cotta, etc. The company recommends that these materials are best cut with the Eveready wet or dry abrasive blades or diamond blades .-Eveready Briksaw Co., 1509 S. Michigan Blvd., Dept. 230, Chicago 5, Ill.



FUEL INJECTION NOZZLE PULL-ER-Latest pulling tool with the well-known OTC label is one that has been designed to remove fuel injection nozzles from the cylinder head on all International Harvester diesel engines. The tool exerts a straight, powerful pull and is said to perform in a few minutes a job that often takes hours. It's adjustable and may be used for other pulling jobs as well. Designated as Puller No. HC-689 it's the latest addition to an ever-growing line.-Owatonna Tool Co., 380 N. Cedar St., Owatonna, Minn



PROPANE - BURNING HEATER-A portable space heater for temporary heating has been introduced in two models. Called the Sonic-Ray, it burns propane gas and a 100-lb tank is said to last from 40 to 60 hr at a cost averaging 11 to 17c per hr. Recommended for drying plaster, mortar, concrete, or for furnishing temporary heat in warehouses, garages, freight cars and the like, it's rated at 85,000 to 150,000 btu's per hr. Total weight is only 31 lb. The Sonic-Ray Model D shown here comes equipped with a regular, 7 ft of hose and manual control for operation. The Model F is constructed in the same way but includes a valve control, thermocouple and pilot light One in a series of factual reports from owners of Farquhar Conveyors

FARQUHAR CONVEYORS SAVE TIME AND LABOR IN POURING CONCRETE*

during construction of



DURING construction of a large eastern hospital, the contractor installed this Farquhar Trough Conveyor to speed delivery of wet concrete. Carrying the concrete directly from the mixer truck to the pouring operation, the Conveyor saved time and money for the contractor... and hard, back-breaking work for his men!

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut your handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent, and permanent conveyors will solve your handling problem. Our engineers will be glad to consult with you... at no obligation!



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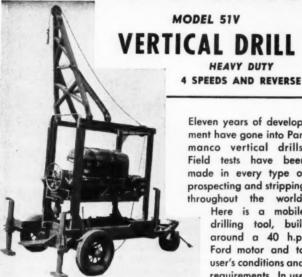


WORLD'S MOST COMPLETE
CONVEYOR LINE

A. B. FARQUHAR COMPANY Division of THE OLIVER CORPORATION

5 or 6 INCH AUGERS ·· drill up to 80 feet 414 INCH AUGERS ·· drill to greater depths

Parmanco



NOTE: 3 Jacks for leveling machine. This Parmanco feature insures straight

Eleven years of development have gone into Parmanco vertical drills. Field tests have been made in every type of prospecting and stripping throughout the world.

Here is a mobile drilling tool, built around a 40 h.p. Ford motor and to user's conditions and requirements. In use today in many fields, it is speeding and

simplifying jobs. In a recent field test an

accurate sample was taken in 30 minutes thru 25 feet of overburden. This was done adjacent to an identical test hole that had taken 8 days to drill and sample by hand.

This Model 51V has four auger rotating speeds and reverse. It has proved its ability to meet the requirements of the general prospecting field where it is not necessary to drill solid limestone.

This machine (Model 51WV) is also built around a Wisconsin 25 h.p. air-cooled motor, 4 speed transmission and self-starter.

PARIS MANUFACTURING CO. PARIS, ILL.

for continuous, unattended operation. The heaters are 20 in. square at the base, 31 in. high and 17 in. in diameter at the top. The tank can be set indoors or outdoors and the heat furnished is exceptionally dry, leaving no condensate or sweating on walls.—Bica Co., 1170 N. State St., Girard, Ohio



PORTABLE, ADJUSTABLE CUT-TER-Under present maintenance methods in much of the gas, petroleum and sewage construction work, a length of pipe is destroyed whenever a new fitting is installed. According to the manufacturer of this new cutter, pipe can be cut effectively right where it's lying in the ditch. In addition, only about one-third as much digging is needed to perform the job. Two cutter sizes are available: One for 6-, 8- or 10-in. pipe, the other for 12-, 14- and 16-in, pipe. (Larger sizes can be custom made.) Power from several sources facilitates field use. A %-in. slow-speed electric drill, its equivalent in an air drill, or a gasoline-engine-powered flexible shaft, geared down, are acceptable. The unit will cut and bevel 10-in. steel gas pipe, for in-stance, in 10 min. Cuts are true, with a flat edge on the inner circumference for immediate welding. Bevel cuts are made usually at 60 deg included angle, but where codes in various areas demand different angles, suitable bits can be furnished. It will cut and bevel steel pipe in one operation, cut cast iron pipe without splits or breaks, and is hinged for use on pipe already installed. It's recommended by the Cast Iron Soil Pipe Institute, Pacific Coast Clay Products Institute, Duriron Co., and manufacturers of Corrosiron for cutting cast iron, Duriron, vitreous clay, water pipe and cement sewed tile up to 12 in.— Springload Mfg. Co., 2412 Aurora. Seattle, 9, Wash.

WHERE TO BUY

Haynes Products Co., Omaha, Neb.





"SEE YOU AT THE POLLS!"



Nobody knows for sure how it started—this line about "See you at the Polls!" we're hearing all over these days.

Best explanation seems to be that it came from that state candidate out west. . . . His opponent in a debate got all riled up and challenged him to fight it out in the alley.

But he said—"I'll settle this the AMERICAN way—I'll see you at the polls!" And the audience picked up the chant.

Now everybody's saying it-and on Nov. 4 everybody will be doing it!

"SEE YOU AT THE POLLS!"





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THE INDUSTRY'S MOST VERSATILE

- Picks itself up
 Easily extends
- Lifting heights up to 94 feet
- Single or Double Drum Hoists
- Platform speed—100 ft. per min.
- Lifting capacity 2,500 lbs.

Optional Equipment: Gin Pole Assembly, "Chicago" Boom, Tip-Over Bucket, Truck Mounting, Interchangeable 10' Extensions.

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(His business paper . . . of course)

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IRVINGTON FORM AND TANK CORP. 20 VESEY ST., NEW YORK 7, N. Y.



rating the same basic principles for gunning concrete as its larger predecessors, the new No. 750 Bondactor is designed primarily for smaller contractors, municipalities and industrial maintenance departments -as well as those larger contractors who want a smaller companion to their present Bondactors. The machine can be hooked up to an 80- or 105-cfm compressor. Plant air, when available, is also suitable. The unit includes all accessories and hoses for hook-up and operation, as well as the patented Bondact gun and sandblast nozzle assembly for wet or dry sandblasting. While designed primarily for gunning sand and cement concrete and for wet or dry sandblasting, the manufacturer claims that it will efficiently and advantageously gun many prepared masonry and refractory coatings. It's a dualcompartment, completely pressurized machine, and it must use perfectly dry materials which are hydrated at the nozzle of the gun. Production is from ½ to ¾ yd per hr, or the equivalent of three- to four-sack batches. Recommended for surface applications over block or brick, waterproofing basements from the inside, repair of disintegrated or broken concrete and sandblasting of all kinds, under all conditions.-Air Placement Equipment Co., 1009-11 W. 24th St., Kansas City 8, Mo.

AUTOMATIC TERRAIN COMPEN-SATOR—The Automatic Terrain Compensator is a new device designed for use with the company's Super-Sweeper. The spring-loaded float device automatically compensates for uneven ground, maintaining a constant broom-ground contact pressure at all times. Other features include finger-tip hydraulic control for regulating broom angle, broom rotation, broom height. All settings can be made by the operator without stopping the machine or leaving his seat. Three sizes are available, 5-, 6- and 7-footers.-Lull Mfg. Co., 314 W. 90th St., Minneapolis 20, Minn.

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

ABRASIVE BELT POLISHING—A 28-p, illustrated booklet titled "How Polisher Pete Put Economy in Polishing" describes the advantages of coated abrasive belt-polishing methods.—Behr-Manning Corp., Dept. F.P. 21, Troy, N. Y.

SICKNESS AND ACCIDENT IN-SURANCE—NON-CAN is the abbreviated title of a non-cancellable type of insurance which should be of interest to all. Once it's in effect it cannot be cancelled by the company for any reason. Payments are made for disability, for instance, which prevents you from "working at your usual job," where others pay only if the disability prevents you from working "at any job or occupation." These and other benefits are spelled out in a pocket-sized booklet No. 70-51, available from Union Mutual Life Insurance Co., Box 548, Portland, Me.

PENTA QUESTION - ANSWER BOOK—Detailed answers to questions frequently asked about pentachlorophenol, a new chemical used to protect wood against decay and insect attack, are included in a 40-p booklet. There are 51 questions and answers, and samples of treated woods range from ties and poles to control of dimensional stability of finished paneling and millwork.—Monsanto Chemical Co., St. Louis 4, Mo.

"LIGHTING FOR INDUSTRY" is the title of a new 96-p handbook that covers the field from general engineering information and economics of lighting to a listing of specified industrial areas. These are further grouped under indoor and outdoor requirements, and the booklet is filled with technical diagrams, charts, sketches and installation photographs. A complete, up-to-date reference book, it's available from Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.

SIMPLIFIED PLANT DESIGN—An economical plant layout, expandable to any future needs, is possible with Macomber steel trusses, sash, doors, decking, siding, columns, struts and girts. Framing plans, column connection details and examples of six different profiles are included in the 20-p booklet. One full-page chart shows safe loadings for roof trusses and bowstring chord angle sizes.—Macomber, Inc., Canton, Ohio.



Advance-Design

CHEVROLET TRUCKS

These
PLAIN HARD FACTS
are important to
economy-minded
truck buyers



Fact No. 1

CHEVROLETS LIST FOR LESS

First cost—the list price—is less for a Chevrolet than for any comparable truck capable of handling the same payload. Chevrolet's position as the world's largest manufacturer of trucks makes possible production savings that are passed on to you.

Fact No. 2

COST LESS ON THE JOB

Proved Chevrolet truck features save money over thousands of miles. Time-tested Valve-in-Head engines, rugged hypoid rear axles, extra-structly channel-type frames, Flexi-Mounted cabs, Ball-Gear steering, Synchro-Mesh transmissions, all contribute to low operating costs with high dependability.

Fact No. 3

EACH TRUCK TAILORED TO ITS JOB

Every Chevrolet truck is factory-matched to the job it's going to do. Tires, axles, frame, springs, engine, transmission, and brakes are right for the operating conditions and load. Whatever your job is, there's a Chevrolet truck to fit it.

Fact No. 4

WORTH MORE AT TRADE-IN TIME

Chevrolet trucks traditionally bring more at resale than other makes costing about the same when new. Chevrolet trucks keep their value longer and give you real, substantial savings right up to the day you sell them. See your Chevrolet dealer soon.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES -

TWO GREAT VALVE-IN-HEAD ENGINES— Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBU-RETOR—fer smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shiffing e HYPOID REAR AXLE—for dependability and long life e TORQUE-ACTION BRAKES—on light-duty models e PROVED DEPENDABLE DOUBLE-ARTICU-ATED BRAKES—on medium-duty models e TWIN-ACTION REAR BRAKES—on heavy-duty models e DUAL-SHOE PARKING BRAKE-for greater holding ability on heavy-

duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STERRING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN



Page 186 — CONSTRUCTION Methods and Equipment — September 1952

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A McGRAW-HILL PUBLICATION





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You can cut costs to the bone on other forming jobs with TRAVELING STEEL FORMS designed and built by BLAW-KNOX

HERE'S a typical example of Blaw-Knox engineering accomplishment in simplifying forming methods. Developed by Blaw-Knox engineers for the construction of Igloo-type storage buildings for the Government, these traveling steel forms reduced form-moving cycles to less than 300 man-hours on each building! They are so effective and yet so simple that slow, "back-breaking" handling was completely eliminated from operations. There are no hand-handled panels! Inside forms are handled by a traveler... others by winch trucks.

Look at the way they're designed. You can see that fast tunneling methods were put to work on surface jobs.

Whether your concreting operations call for forming above or under ground, remember... Blaw-Knox engineers have years of experience in simplifying forming methods. That's why it's important to consult with Blaw-Knox first, in the preliminary planning stage, before bids are submitted. We will study your job and recommend the most suitable form design to save you time and money. Blaw-Knox Steel Form Consultation Service is ready to help you from preliminary planning to final pour. Write, wire or phone today.



WRITE FOR BULLETIN 2035

Get complete details about Blaw-Knox Steel Forms and the consultation service that is available to any contractor without obligation.



CONSULTATION SERVICE BY

BLAW-KNOX DIVISION of Blaw-Knox Company

Farmers Bank Building, Pittsburgh 22, Pa.

NEW YORK - CHICAGO - PHILADELPHIA - BIRMINGHAM - WASHINGTON - SAN FRANCISCO

WELLMAN Williams Type

FAST BUCKET OPENING SPEEDS OPERATIONS



• Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations.

also gives a bigger spread in the open bucket for the same headroom.

Wellman's weldeddesign buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

Want Facts?

Write for free descriptive bulleting

CLAMSHELL . DRAGLINE . CUSTOM-BUILT SUCKETS . STONE AND WOOD GRABS

THE WELLMAN ENGINEERING COMPANY

7000 Central Avenue Cleveland 4, Ohio







For sealing vertical construction or expansion joints in Relaining Walls, Abutments, Wing Walls, Foundations, etc., particularly when one side will be backfilled and protection from water seepage is necessary. Has rigid backing of asphalt joint material and surface and both edges coated with Para-Plastic, which maintains bond with concrete at all times.

Para-Plastic Sealing Compound is molded into strips for sealing of keyed construction joints and cracks or breaks in vertical concrete surfaces. Concrete poured against the strip, after setting up, will bond with strip to form watertight seal.

NARROW STRIP Pressure Seal

Para-Plastic Pressure Seal is available in both Solid Para-Plastic, and Para-Plastic coated sponge rubber types which are rectangular or square in cross section. Designed for sealing existing expansion joints or contraction cracks in vertical or sloping mesonry walls and surfaces.

Servicised Engineers are available for consultation on your joint sealing problems. Write for details and specification data. There is no obligation.

*Para-Plastic is one of the many Patented products developed for the Construction Industry by Servicised Products Corp.

SERVICISED PRODUCTS CORP. 6051 W. 65th STREET . CHICAGO 38, ILLINOIS

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you can go down and get it 15" below grade



you can go up and get it 15 feet above grade



-and do it with CROWD AND HOIST . . . no wheel traction . . .

If you are doing excavation work you probably realize the mechanical advantages of big shovels—simultaneous and independent hydraulic crowding and hoisting, variable crowd action at any dipper position, changeable buckets, etc. But, do you know all these advantages have been engineered into the Dempster-Diggster to give you a faster, more versatile excavator, on pneumatic tires with a 1 cu. yd. capacity. In addition the Dempster-Diggster does anything a conventional front end loader can do—and does it faster at less cost with its 1½ or 2 cu. yd. bucket. In excavation the Dempster-Diggster is without equal for working in tight places . . . dumps at 11'3" height . . . travels at truck speeds from job to job. The versatile Dempster-Diggster is a fast, power-packed excavator and loader you can't afford to be without! Write today for our new catalog No. 1032. A product of Dempster Brothers, Inc.



DEMPSTER BROTHERS, 392 Shea' Bldg., Knoxville 17, Tennessee

SEARCHLIGHT SECTION

EMPLOYMENT: BUSINESS: "OPPORTUNITIES"

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1.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line. Discount of 10% if full payment is made in advance for 4

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undisplayed advertising rate is one-half of above
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Letterheads-Smart. distinctive, specially designed for Realtors, Archi-tects, Builders. Your name featured in colorfu, appropriate designs. Send 10¢ for samples. Hobbycraft Stationers, Box 475, Auburn, N. Y.

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MEN

Major earthmoving equipment manufacturer has responsible positions open for field representatives to serve in continental United

States. Knowledge of time study . equipment performance .

earthmoving techniques essential.

Civil engineer graduate preferred. Send full particulars of experience

> P5034 CONSTRUCTION METHODS & EQUIPMENT

520 N. MICHIGAN AVE.

CHICAGO 11, ILL.

and education to

individual Spaces with border rules for prominent display of advertisement. The advertising rate is \$13.20 per inch for all affectiving appearing on other than a contraint of the state of

DISPLAYED

Superintendents and Project Managers Training Course.

All instruction by mail. Send today for sample lesson and complete details.

GEO. E. DEATHERAGE & SON

WANTED NEW CRAWLER TRACTORS

D8—D7—D6—D4H14—D4—D2 TD24—TD18A—TD14A—TD9—TD6 HD20—HD15—HD9—HD5G CASH WAITING

EVANS and EDELL 159 WEST 22 ST. NEW YORK 11, N. Y. ALGONQUIN 5-3800

"BARGAIN FOR CASH"

Three Model "C" Tournapulls; all equipped with LeTourneau "LS" Scrapers.

Tractor Units all have 21.00 x 24 tires, and rubber on both tractors and scrapers in very good condition.

One Model "C" Tournapull, equipped with "Tournatrailer".

All tractor units have "Caterpillar" Diesel Engines. All equipment in running order.

HOBSON AND COMPANY "Caterpillar Distributor

2131 Washington St. Kansas City, Mo. Phone: Harrison 6615

WANTED **NEW POWER SHOVELS**

DIESEL POWERED: 22B-38B-54B CASH WAITING

EVANS and EDELL 159 WEST 22 ST. NEW YORK 11, N. Y. ALGONQUIN 5-3800



IMMEDIATE DELIVERY

NEW MACHINERY PARTS

Caterpillar • Bucyrus-Erie •

Lorain . LeTourneau,

and other Misc. Parts

MAIL REQUIREMENTS

P. O. Box 53, Trenton, N. J.

IF THERE IS Anything you want

that other readers of this paper can

OR-

Something you don't want

that other readers can use, advertise it in the

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CONSTRUCTION

HOWARD T. OLSEN E. WEYENETH dvertising Sales Manager

J. G. JOHNSON Business Manager

Soles Representatives: H. T. Buchanan, 330 W. 42nd St., New York; F. G. Hudson, Knox Bourne and G. A. Mack, 520 N. Michigan Ave., Chicago; R. E. Dorland, 68 Post Street, San Francisco; W. C. Bradford, 1510 Hanna Bildg., Cleveland; W. E. Donnell, Continental Bildg., St. Louis; H. L. Keeler, 1111 Wilshire Birdd., Los Angeles; R. C. Maulishy, 1321 Rhodes-Haverty Bildg., Atlanta; James Cash, First National Bank Bildg., Dalfas. Other Sales Offices: Architects Bildg., 17th and Sansom Sts., Philadel-Ridge, Derivatives, 130 Penabaca, 1316, Derivative, 330 Pert. Salurg. Bildg., Berton 18; 95 Farringdon St., London, E.C. 4.



BRIDGE DECKS READY FOR TRAFFIC, UNDERPASSES CLEARED IN 1/3 THE USUAL TIME

The Port of New York Authority wanted the Interchange between the New Jersey Turnpike and the Lincoln Tunnel ready for early public use and the work done with the least traffic interference on the highways it crosses.

They accomplished this with Lehigh Early Strength Cement. Bridge decks were ready for traffic and highways cleared of shoring in ½ the usual time. The Turnpike opened on its scheduled date.

What's more, important economies resulted. Form costs were cut by ½. Winter curing costs were greatly reduced; the savings on this alone amounted to considerably more than the extra cost of Lehigh Early Strength Cement.

This is typical of how Lehigh Early Strength Cement can help you save time, cut costs and meet highest quality standards.

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. . CHICAGO, ILL. . SPOKANE, WASH.

Bridge over New Jersey Turnpike—one of four bridges on the Interchange between the Turnpike and Lincoln Tunnel.



Work proceeded as scheduled, regardless of winter weather, on bridge over Route S-3.

Built by: THE PORT OF NEW YORK AUTHORITY
Contractor: POIRIER & McLANE CORP.
New York City
Ready Mixed Concrete: HUDSON BUILDERS
MATERIAL CO., Jersey City, N.J.



LEHIGH PORTLAND CEMENT . LEHIGH EARLY STRENGTH CEMENT . LEHIGH AIR-ENTRAINING CEMENTS . LEHIGH MORTAR CEMENT

Methods Memo . .

A 35% CONSTRUCTION RISE is forecast in the report of the President's Materials Policy Commission dealing with our resources outlook for the quarter century 1950-1975. As the largest user of materials in the U. S. economy, the construction industry received a major share of attention.

But to accomplish this increase, designers are told they will have to make sweeping changes in construction practices. And there will have to be a decided shift from materials in tight supply to more abundant types and to incorporate many more of the newer construction practices shown by research to be practical, the report warns.

MOUSE TRAPS YET? The LeTourneau "Co-Operator" tells this one: A Verdon, Neb., operator could not start his tractor engine so he called in the mechanics. They discovered that a field mouse had set up shop in one of the cylinders, entering and leaving via the exhaust manifold. He was a thrifty mouse, too; had stored corn kernels on top of the piston.

ASPHALT IN BAGS is a possibility if tests being conducted by the Army Engineers at Fort Belvoir, Va., prove the idea sound. Certain types of asphalt are being packaged for shipment in multi-wall paper bags to all parts of the world.

After heating to pouring consistency, the asphalt is poured into the bags which have a clay liner to prevent the hot asphalt from sticking to the paper and to aid in stripping of the bag from the contents. Upon arrival at destination, bags are cut open, the paper stripped off and the asphalt is ready for use. Handling and storage tests are being made under high and low temperature conditions.

LARGEST SINGLE CONTRACT apparently ever let has been given to Peter Kiewit Sons' Co., Omaha, for a new gaseous diffusion plant for the production of uranium 235 in Pike County, Ohio, near Portsmouth, by the Atomic Energy Commission.

Preliminary plans call for a plant estimated to cost about \$1,200,000,000 and ultimately requiring 1,800,000 kw of electric power to be supplied from existing power plants and new ones to

be built. As principal construction contractor, the Kiewit Co. will supervise an average employment somewhere around 17,000 on a job expected to take about four years.

TRANS-CANADA COVERAGE—

Late July found three of our editors spread from coast to coast in Canada. Hank Perez was in Labrador looking over the railroad being pushed through the wilderness to the iron ore development. Larry Wise was way up in British Columbia on the fabulous Kitimat project being built for the Aluminum Co. of Canada. Rich was also in British Columbia and Alberta on the 24-in. oil pipeline being pushed by Bechtel, Mannix, and Comstock Mid-Western for 720 mi across the Canadian Rockies. Just another indication of how this staff rolls up 75,000 mi per year covering construction projects for your benefit.

HOW TO BLOW UP A SAFE was demonstrated neatly by burglars in Findlay, Ohio, recently. Hoodlums broke into a builders' supply store and prepared for blasting by stacking bags of vermiculite around the safe. When their safe-cracking charge went off, the vermiculite prevented the shattering of a large plate glass window only 12 ft away.

FIVE MEN KILLED—It makes a gruesome headline, but it happened in an Arizona quarry when a wooden truck-loading hopper collapsed under a load of 150 tons of crushed rock and crashed down upon seven men who were eating their lunch in the shade underneath.

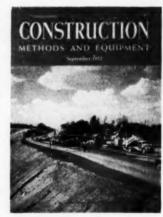
"I LIKE your 'As it Was in the Beginning'", writes George C. McNutt of Oakland, Calif. "But I can tell you the Fresno scraper isn't too accurate a drawing—no wheels, handles too thick and the bowl appears a bit skimpy. I speak from considerable experience in using these to clean corrals around the ranch during my teens."

A LONG LOOK AT DIESEL FUELS this summer (touched off by Homer Campbell's article on fuels, page 142 (CM&E April 1952) brings some reassuring information. Major oil companies have been putting some of their best engineering brains for some

years to producing fuels and the lubricants to go with them. Notable success has been achieved after long, hard work and some tangible results have been presented recently in two excellent articles (see page 135 in the August issue and page 127 in the July issue).

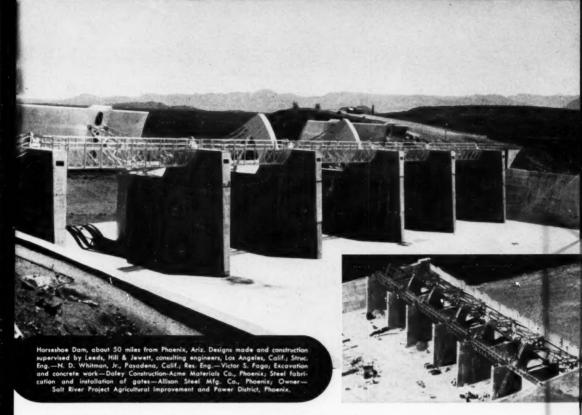
A practical and economical course for a contractor, recommended by wellknown fuel and oil lubricant suppliers,

- Always deal with a reputable manufacturer.
- Furnish him with the most complete information possible about your equipment, operations and problems.
- 3. Use only the products recommended.



On the Cover . . .

Stretched out in good working order, a spread of Blaw-Knox paving equipment winds up the western extension of the Pennsylvania Turnpike near the Ohio line for Patterson Construction Company of Monongahela City, Pa. Patterson paved 3.9 mi of the famous duallane superhighway, handling each 24-ft lane in one operation. Leading the equipment parade in the cover scene is a Multifoote 34-E paver, followed by an adjustable concrete spreader and an adjustable finisher, both Blaw-Knox. The same-make aggregate batcher, cement bins, self-aligning road forms and precision subgrader completed the paving set-up. Shortage of mesh, cement and batch trucks plagued the contractor at times, but he managed to finish up on schedule.



POZZOLITH CONCRETE In Dam With World's Largest Radial Gates

The increasing use of Pozzolith Concrete in noteworthy structures, like this \$900,000 reservoir enlargement project, results from the fact that Pozzolith has proved to be the most economical means of meeting concrete requirements.

Here the problem was to obtain easy placeability yet maintain designed strength, since the piers were comparatively thin sections (see small photo) and heavy with steel reinforcement. The answer was Pozzolith . . . because it improves workability even with total water cut as much as 15%.

Pozzolith's cement dispersing, water reducing action, plus its entrainment of the optimum amount of air, also produced these concrete properties:

- MINIMUM SHRINKAGE
- GREAT DURABILITY
- LOW PERMEABILITY
- GOOD APPEARANCE
- HIGH BOND OF CONCRETE TO STEEL

Over 9,000,000 cubic yards of Pozzolith Concrete placed in 1951 alone testify to Pozzolith's ability to produce better concrete at lower cost. May we send you complete information and the Pozzolith booklet?

*Close fitting pre-cast bascule weights which counterbalance the gates, also I-beam seal at hottom of gates, were precision grouted with EMBECO—another Master Builders' cement dispersion product, which produces non-shrink grout and mortar.



Subsidiary of American-Marietta Company



"SELDOM DO WE ENDORSE ANY CONSTRUCTION EQUIPMENT" begins a letter from John B. Taylor, Taylor Brothers president, pictured here on the job, "... but after using the new 34E... we feel it our responsibility to write you."

According to its president, John B. Taylor, Taylor Brothers Company, Inc., paving contractors from Birmingham, Michigan, have found that the new Worthington Model WP paver will lay more highway faster and at lower cost than any paver his company knows of.

Says Mr. Taylor: "We thought we knew about your pavers' superiority after using them for 20 years, but this new 34E beats them all."

The Taylor Company has been using its Wor-

thington Dual Drum Paver on a paving job near Dearborn.

The new Worthington paver is the practical result of forty years of experience in building pavers and other construction equipment. Learn how it can help speed your paving jobs by writing for Bulletin R-1700-B7 to Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Construction Equipment Division, Plainfield, New Jersey.

waw worthington bual-baum paven at work for Taylor Brothers on a paving job near Dearborn, Michigan. Taylor's job reports indicate that the new paver, with its aix-and-a-half-second skip, faster transfer and discharge automatic water control system, and hydraulically controlled bucket, is laying more highways and streets at less cost.





WORTHINGTON

Construction Equipment

If It's A Construction Job, It's A Bue Brute Job